Phillips

Via Satellite

DECEMBER 1997

Satellites and Entertainment

- Rural Telephony
- Global VSATs
- Year in Review

MITEQ TEST TRANSLATORS

- First to add new satellite requirements around the world
- Most comprehensive offering in the industry
- Largest selection of available options
- All translators are data quality
- Customized designs for specialized performance or frequency requirements

TRANSMIT BAND TO L-BAND

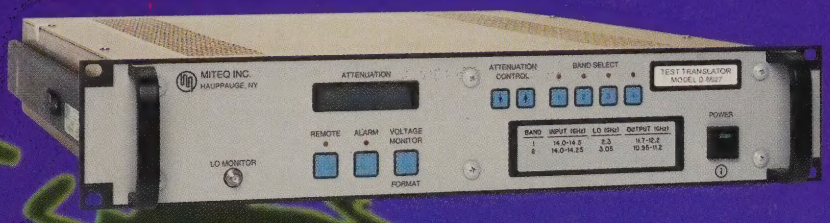
MODEL NUMBER	INPUT FREQUENCY (GHz)	OUTPUT FREQUENCY (GHz)	LO FREQUENCY (GHz)
DN–6–1.2	5.925–6.425	0.95–1.45	4.975
DN–6–1.2–INV	5.925–6.425	0.95–1.45	7.375
DN–6–1.24	5.845–6.425	0.95–1.53	4.895
DN–8.15–1.2	7.9–8.4	0.95–1.45	6.95
DN–13–1.2	12.75–13.25	0.95–1.45	11.8
DN–14–1.2	14.0–14.5	0.95–1.45	13.05
DN–14.1–1.35	13.75–14.5	0.95–1.7	12.8
DN–14.65–1.1	14.5–14.8	0.95–1.25	13.55
DN–17.55–1.2	17.3–17.8	0.95–1.45	16.35
DN–17.7–1.35	17.3–18.1	0.95–1.75	16.35

TRANSMIT BAND TO RECEIVE BAND

MODEL NUMBER	INPUT FREQUENCY (GHz)	OUTPUT FREQUENCY (GHz)	LO FREQUENCY (GHz)
DN–8011	5.925–6.425	3.7–4.2	2.225
DN–8011–1	5.845–6.425	3.62–4.2	2.225
DN–8011–2	5.95–6.525	3.625–4.2	2.325
DN–8011–3	5.84–5.93	2.55–2.63	3.3
DN–8011–4	6.725–7.025	4.5–4.8	2.225
DN–8011–5	6.425–6.725	3.4–3.7	3.025
DN–8–7	7.9–8.4	7.25–7.75	0.65
DN–8–7–1	7.9–8.4	7.25–7.75	0.725
DN–13–10.95	12.75–13.25	10.7–11.2	2.05
DN–13.9–12.6	13.75–14.0	12.5–12.75	1.247
DN–13.9–12.6–1	13.75–14.0	12.5–12.75	1.25
DN–13.9–12.6–2	13.75–14.0	12.5–12.75	1.2495
DN–14–10	14.0–14.25	10.95–11.2	3.05
DN–14–11	14.0–14.25	11.45–11.7	2.55
DN–14–11–1	14.25–14.5	11.45–11.7	2.8
DN–14–11–2	14.25–14.5	10.95–11.2	3.3
DN–14–11–3	14.25–14.5	11.45–11.7	2.795
DN–14–11.3	14.25–14.5	11.2–11.45	3.05
DN–14–11.71	14.0–14.5	11.46–11.96	2.54
DN–14–11.8	14.0–14.25	11.7–11.95	2.295
DN–14–12	14.0–14.5	11.7–12.2	2.3
DN–14–12.45	14.0–14.5	12.2–12.7	1.8
DN–14–12.5	14.0–14.5	12.25–12.75	1.75
DN–14–12.5–1	14.0–14.5	12.25–12.75	1.748
DN–14–12.5–2	14.0–14.5	12.25–12.75	1.73
DN–14–12.6	14.0–14.25	12.5–12.75	1.495
DN–14–12.6–1	14.0–14.25	12.5–12.75	1.5
DN–14–12.6–2	14.0–14.25	12.5–12.75	1.498
DN–14.1–11.3	13.75–14.5	10.95–11.7	2.8
DN–14.65–11.85	14.5–14.8	11.7–12.0	2.79782
DN–14.85–12.65	14.7–15.0	12.5–12.8	2.232
DN–17.55–11.95	17.3–17.8	11.7–12.2	5.6
DN–17–12	17.3–17.8	12.2–12.7	5.1
DN–17.7–12.1	17.3–18.1	11.7–12.5	5.6
DN–18–11	18.1–18.4	10.7–11.0	7.4

TEST TRANSLATORS – HIGH-VALUE

MODEL NUMBER	INPUT FREQUENCY (GHz)	OUTPUT FREQUENCY (GHz)	LO FREQUENCY (GHz)
DNS–6–4–LC	5.845–6.425	3.62–4.2	2.225
DNS–6–1.2–LC	5.925–6.425	0.95–1.45	4.975
DNS–6–1.2-INV–LC	5.925–6.425	0.95–1.45	7.375
DNS–14–1.2–LC	14.0–14.5	0.95–1.45	13.05
DNS–14–12–LC	14.0–14.5	11.7–12.2	2.3



TEST TRANSLATORS – SWITCHABLE BAND

MODEL NUMBER	BAND	RF INPUT (GHz)	LO FREQUENCY (GHz)	RF OUTPUT (GHz)
D–8625	1	14.25–14.5	2.8	11.45–11.7
	2	14.0–14.25	3.05	10.95–11.2
D–8626	1	14.25–14.5	2.8	11.45–11.7
	2	14.0–14.25	3.05	10.95–11.2
	3	14.0–14.5	2.3	11.7–12.2
D–8627	1	14.0–14.5	2.3	11.7–12.2
	2	14.0–14.25	3.05	10.95–11.2
D–8628	1	14.25–14.5	2.8	11.45–11.7
	2	14.0–14.25	3.05	10.95–11.2
	3	14.0–14.25	1.495	12.505–12.755
D–8629	1	14.25–14.5	2.8	11.45–11.7
	2	14.0–14.25	3.05	10.95–11.2
	3	14.0–14.25	1.495	12.505–12.755
	4	14.0–14.25	2.295	11.705–11.955
D–8630	1	14.0–14.25	2.55	11.45–11.7
	2	14.25–14.5	3.3	10.95–11.2
	3	14.0–14.25	1.5	12.5–12.75
D–8631	1	14.25–14.5	2.8	11.45–11.7
	2	14.0–14.25	3.05	10.95–11.2
	3	14.0–14.25	2.295	11.705–11.955
D–8632	1	14.0–14.25	2.55	11.45–11.7
	2	14.25–14.5	3.3	10.95–11.2
D–8633	1	14.0–14.25	2.55	11.45–11.7
	2	14.25–14.5	3.3	10.95–11.2
	3	14.0–14.5	2.3	11.7–12.2
D–8634	1	14.0–14.25	2.55	11.45–11.7
	2	14.25–14.5	3.05	11.2–11.45
	3	12.75–13.25	2.05	10.7–11.2
D–8635	1	13.0–13.15	2.24	10.76–10.91
	2	13.2–13.25	2.3	10.9–10.95
D–8637	1	14.0–14.5	1.748	12.25–12.75
	2	14.5–14.8	2.79782	11.7–12.0
D–8638	1	14.25–14.5	2.8	11.45–11.7
	2	14.0–14.5	1.748	12.25–12.75
	3	14.0–14.25	1.498	12.5–12.75
D–8639	1	5.8–6.425	2.225	3.625–4.2
	2	6.425–6.725	3.025	3.4–3.7

For additional information or technical assistance, please contact either Art Faverio at (516) 439-9120, e-mail afaverio@miteq.com or, Chris Alfenito at (516) 439-9108, e-mail calfenito@miteq.com.

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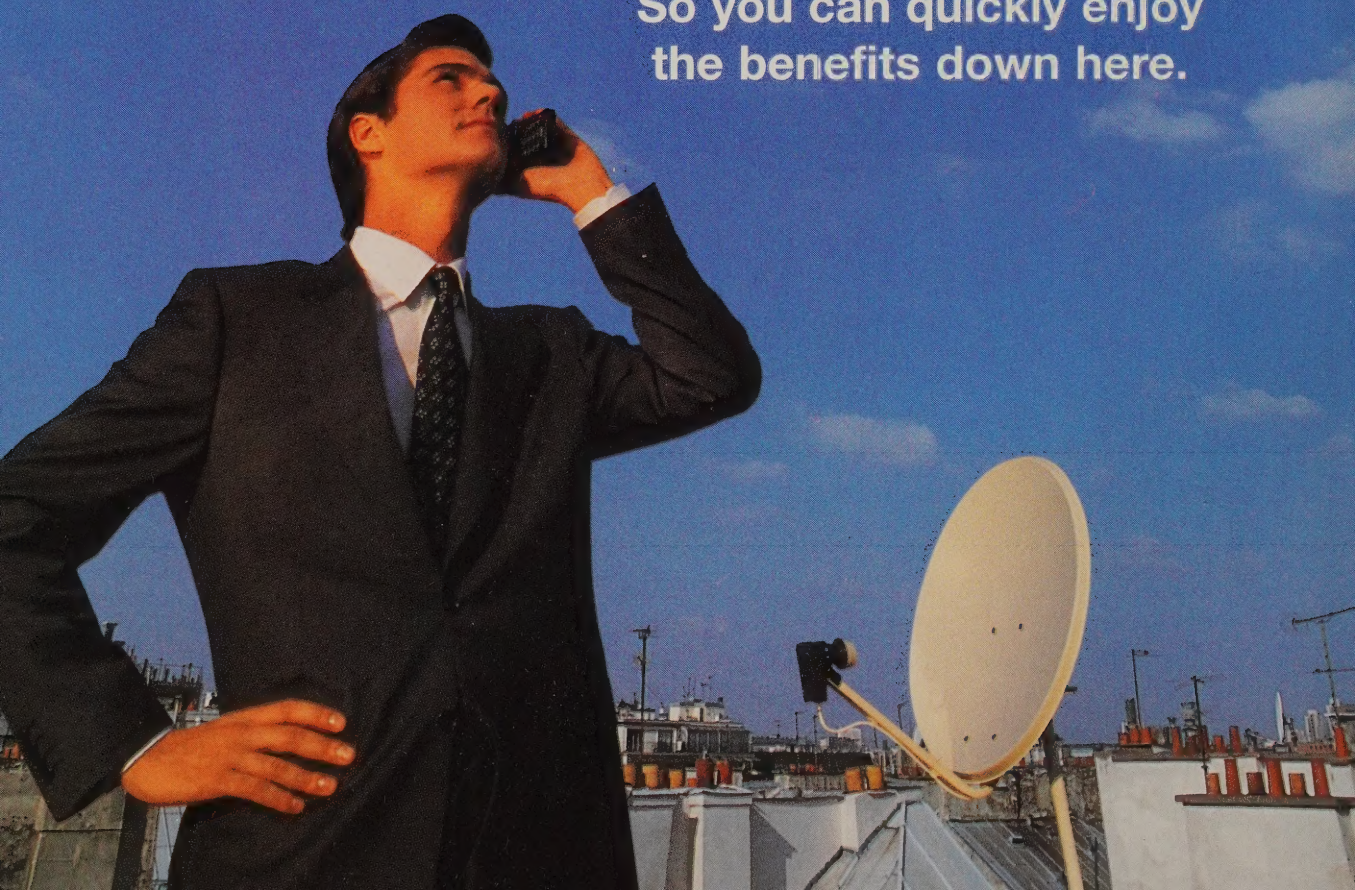

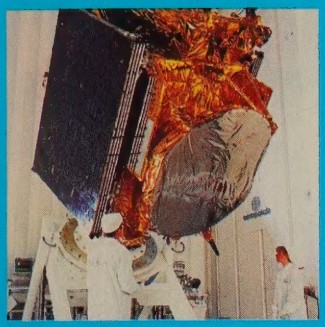

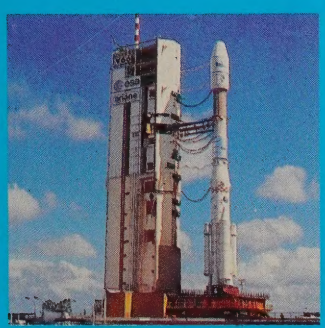

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Circle Reader Response 2

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The Frequency Band Puzzle

With the ink hardly dry on Ka-band licenses, the U.S. satellite industry has requested FCC authorizations for an entire flock of new satellites to operate in the V-band (also known as the Q-band). Hardly anyone, however, knows what these alphabetical references mean and there is disagreement over which letter to use for these new applications.
—by Gerald E. Oberst Jr.

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The Year in Review

The year that is about to end was a frenzied one for satellite operators, manufacturers and investors the world over, and it was equally busy for regulatory bodies eager to invite competition into long-closed telecommunications markets.—by Sam Silverstein

RURAL TELEPHONY 24
Making the Connection

Approximately 3 billion people live their lives with no access to a telephone. Those of us accustomed to modern day conveniences would describe such a day as somewhat of a nightmare. In many cases, satellite technology is providing the much-needed connectivity.
—Kathy McConnell Kessler

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There's one undeniable fact about the global VSAT market: it's growing. This month, *Via Satellite* takes a look at the overall, worldwide VSAT market, scrutinizing trends and issues affecting this vibrant segment of the satellite industry.—James Careless

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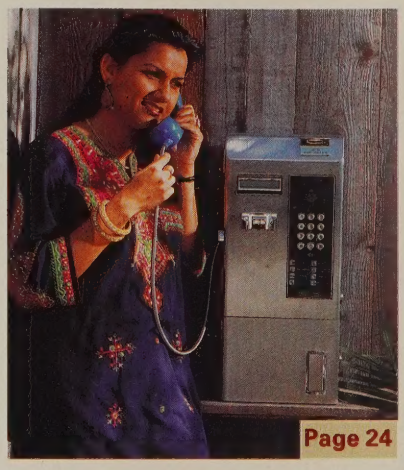
A Love Story

Since satellites first became commercially available in the 1970s, the technology has contributed to reshaping the business of entertainment. Today, those geostationary birds continue to affect Hollywood's stellar performance.—Honey Berman

MIPCOM OVERVIEW 54
Channels A "Go-Go"

With more channels and international launches coming onto the scene, the race for bandwidth is more competitive than ever. And the frenzied activities at Mipcom were indicative of this race for space.—Chris Forrester



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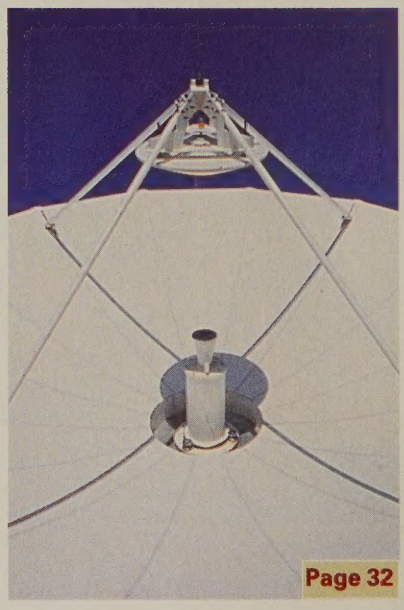

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About the Cover: This month, *Via Satellite* looks at the effect satellites are having on the entertainment industry. Cover design by Rhonda Scharlat.

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Circle Reader Response 3

Editor's Insight

Delivering on the Promise?

Communications via satellite: for many years no other technology has held so much promise to meet the telecommunications needs of so many. Satellites, with their large footprints, can provide ubiquitous coverage where no terrestrial telecom infrastructure exists. For decades, organizations like the ITU and the United Nations have upheld the potential of satellite technology to bring voice, video and data services to emerging nations where billions of people do not have access to even the most basic communications services.

So, after four decades of existence, why have satellites not delivered on this promise?

It is not that satellites have not been available to emerging countries, which comprise the majority of the world's land mass and populations. These nations have been members of international satellite organizations for many years. But, as it turned out, the very structure of the ISOs often hampered the effective provision of services in these areas. Now, commercial competition is leading slowly, but inexorably, to better customer service and more options around the world.

From a technical standpoint, emerging areas were often the last to benefit from the world's leading-edge spacecraft. Because they did not use large amounts of capacity, many emerging countries have not been covered by the newest satellites, but by older birds with low-powered footprints not conducive to the latest small-dish offerings. Today, the race to space is resulting in new satellites for all regions. High-powered birds for VSATs, DBS, rural telephony, Internet, business television and distance education services are being launched over Asia, Latin America, the Mideast and, more recently, Africa.

Perhaps the most difficult barrier to overcome is economic. The majority of people in emerging countries cannot afford satellite services and equipment. As economic growth spreads in regions like Latin America, Asia (until recently), and the Mideast, however, larger segments of the populations there are raising their standards of living. Often, one of the first appliances they purchase is satellite TV. DBS, satellite/cellular handsets, and Internet services are expected to grow in popularity in emerging areas, especially as mass production of terminals leads to decreasing prices for consumers. One innovative program targeted specifically to emerging countries will provide the world's first direct-to-user digital audio services via satellite.

The *status quo* appears to be changing. If current trends continue, and all indications are that they will, the satellite industry will finally deliver on its promise and its ability to bring affordable communications to the people who most need them.

Cynthia Boeke
Editor/Associate Publisher

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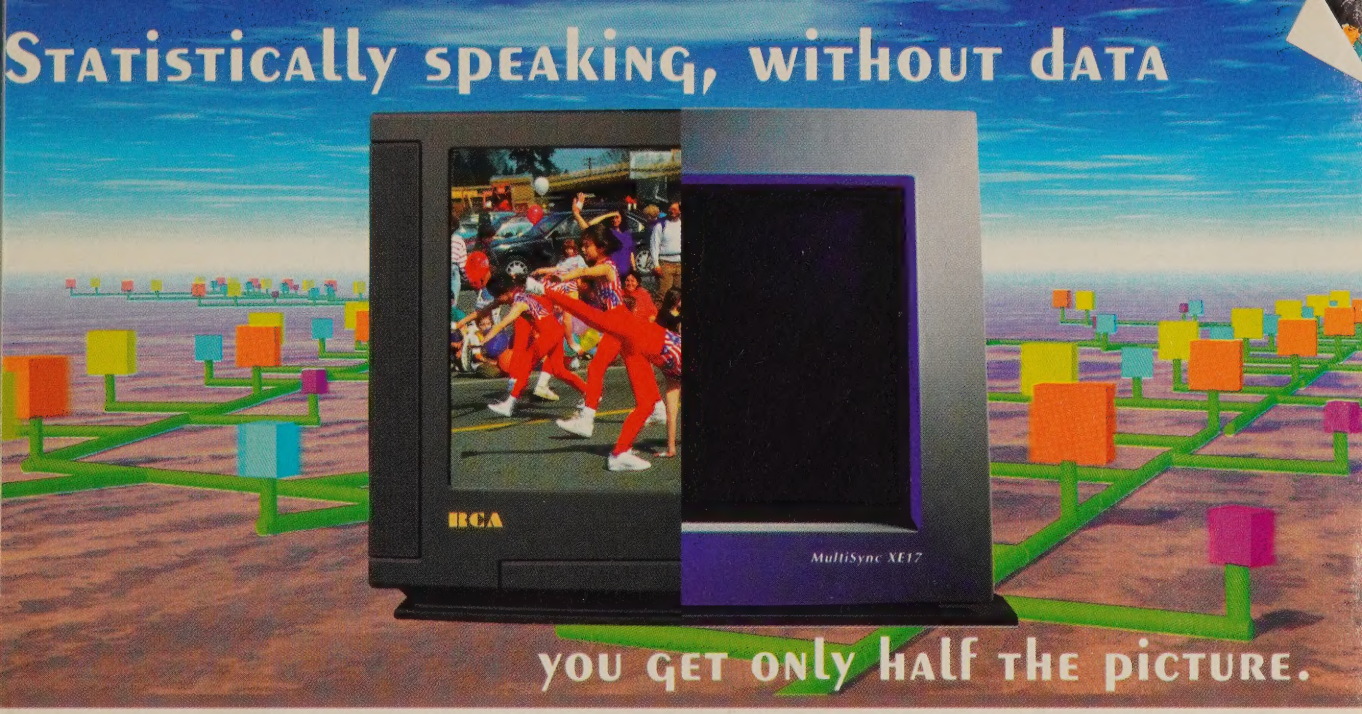
Statistically speaking, without data



True Data Statistical Multiplexing of MPEG-2 Transport Streams

You have already realized the efficiencies offered by multiplexing MPEG video for satellite delivery. However, you may be missing out on the further efficiencies of data multiplexing. What if your customers could multiplex and deliver data during the off hours of their satellite video delivery? What if the tool that offered this possibility also offered bandwidth on demand which dynamically adjusted to available capacity? What if you could allow your customers to implement switched or permanent virtual channels (SVC & PVC) at their discretion?

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For The Record

RECENT LAUNCHES AND CONTRACTS

✣ CHINA GREAT WALL

On October 17, 1997 (Beijing time), the Long March 3B launch vehicle successfully boosted the **Apstar 2R** telecommunications satellite into orbit from the Xichang Satellite Launch Center in the Sichuan Province of China.

The satellite, built by Space Systems/Loral for the APT Satellite Co., is designed to provide voice, video and data services to the Asia-Pacific region as well as Europe, Russia, the Middle East and Africa.

✣ ILS

Echostar Communications Corp.'s **Echostar 3** satellite was successfully launched from Cape Canaveral on October 5, 1997. The satellite, an A2100 design built by Lockheed Martin, was put into geosynchronus transfer orbit by an Atlas 2AS launch vehicle.

The activation of Echostar 3 will complement the company's current programming by expanding international, educational and business programming, together with data delivery and possible retransmission of local channels to select markets. Echostar 3 is equipped with 32 transponders operating at 120 watts per channel. The satellite will orbit at 61.5°W, where Echostar is authorized for up to 11 channels.

✣ ISRO

On October 5, 1997, the Indian Space Research Organization (ISRO) declared the **Insat 2D** lost in orbit after repeated attempts to reacquire the satellite. On October 1 the satellite lost earth-lock due to a short circuit on one of the two power lines.

Insat 2D was reacquired on the morning of October 2 and placed in normal operating mode. It was, however, generating only 25 to 30 percent of its expected power output. ISRO switched on three of the satellite's 23 transponders, and kept the bird under close observation in an effort to study and analyze its degraded performance. The satellite had lost all its redundancy and its thermal management had become difficult.

Insat 2D lost earth-lock again on October 4 because of problems associated with the thermal management which in turn led to anomalies in the propulsion system that maintains the satellite attitude. The compounding of the problems resulting from the power loss, thermal management and the propulsion system made the recovery of the satellite impossible and it was declared inoperable.

In other news, ISRO and its commercial marketing arm, Antrix Corp. Ltd., successfully launched the **IRS 1D** earth imaging satellite on September 29 from Sriharikota, India. The satellite is an identical twin to the IRS 1C, launched in December 1995.

The dual use of these satellites enables Space Imaging Eosat, the exclusive provider of IRS imagery to global markets, to offer 5.8-meter resolution images to its customers twice as often as is currently possible with just the IRS 1C. The imagery is useful for applications as diverse as natural resource planning, agricultural monitoring, urban and transportation development, natural disaster assessment, media use and more.

✣ POLYOT

On September 23, 1997, Polyot's Cosmos rocket launched the Final Analysis **Faisat 2V** satellite from the Plesetsk Cosmodrome in northern Russia. The satellite is bound for a technology and demonstration mission and the startup of commercial telecommunications services. Its predecessor, Faisat 1, was the first U.S. commercial satellite to launch from Russia in 1995.

Final Analysis Inc. of Lanham, MD, manufactured Faisat 2V to advance new space-based telecommunications technology aimed at providing low-cost global data communications to fixed and mobile customers. Final Analysis' planned global constellation of satellites is expected to provide digital data services to deliver information to consumers, industries, environmental agencies and governments around the world.

✣ U.S. AIR FORCE

A U.S. Air Force Titan 4B rocket successfully launched the **Cassini/Huygens** mission to Saturn on October 15, 1997, from Cape Canaveral Air Station. In the course of its mission to study the formation of planets, the dual spacecraft will fly by Venus and Jupiter before arriving at Saturn. Once in orbit around the ringed planet, the Huygens probe will detatch from the Cassini orbiter and fly directly into the atmosphere of Titan, one of Saturn's moons. Instruments on the probe will relay data to the orbiter throughout the probe's descent and landing.

CONGRESS MULLS SATELLITE COMPETITION ACT

As Intelsat and Inmarsat continue to ponder how they will shed their heritages as government-sponsored organizations and privatize, Congress heard testimony in early October from several key individuals in the satellite industry concerning the Communications Satellite Competition and Privatization Act of 1997 (H.R. 1872).

Testifying before the House Telecommunications, Trade and Consumer Protection Subcommittee, Comsat Vice President and General Counsel Warren Zeger said the legislation would force Comsat to exit growth businesses such as Internet access and abandon already-signed customer contracts.

However, the three commercial propo-

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A good example is the Globalstar network for worldwide mobile telephony. Another is Loral Skynet. Still another is CyberStar. Others are under development.

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nents of the legislation received support from Jack Gleason, associate administrator for international affairs at the National Telecommunications and Information Administration. Gleason said he believes Intelsat and Inmarsat have had success beyond their creators' expectations, making it necessary for the United States to take a lead role in disbanding the two organizations' current structure.

"Congress played a significant role in creating Intelsat and Inmarsat," said Gleason. "It is entirely appropriate that Congress play an equally central role as the ISOs [international satellite organizations] contemplate restructuring."

Members of the subcommittee generally said they support U.S. government intervention in the transformation of the world's satellite industry. Commerce Committee Chairman Thomas Bliley (R-VA) said he believes the time is ripe for the U.S. government to step in and push for Intelsat and Inmarsat to change. Intelsat's "supporters call it a 'cooperative,'" he said. "Where I come from, it's called a 'cartel.' Either way, it's high time for them to be privatized."

But Representative Albert Wynn (D-MD) had words of caution for the subcommittee, warning that the matter of reforming Intelsat and Inmarsat is delicate. "We're proposing dismantling two satellite systems that have served the world well," Wynn said. "We have to take into account the views of the State Department and the implications for foreign policy, as well as the private sector."

GE AMERICOM FORMS EDUCATIONAL NEIGHBORHOOD

GE American Communication's (GE Americom) new satellite, GE 3, which was launched September 4, 1997, is now delivering Public Broadcast Service programming.

PBS will use multiple GE 3 transponders to transmit its national programming and educational services to PBS member stations, colleges, schools, businesses and audiences nationwide.

With PBS aboard, GE Americom has declared its intent to position the satellite to serve as the hub of a vibrant learning community serving educational broadcasters, universities, schools, corporate training centers, government agencies and at-home learners.

GE 3, located at 87°W, is a hybrid satellite with 24 C-band 24 Ku-band transponders.

LORAL ACQUIRES ORION AND MEXICAN STAKE

Loral Space and Communications Ltd. ended months of speculation about how it would expand its satellite business internationally by announcing in October that it will pay $490 million in stock to acquire Orion Network Systems Inc., while also bidding for a stake in the much-publicized Mexican satellite auctions.

Orion's stock price shot up 27 percent on the news that GE American Communications Inc., Loral or another well-established satellite operator was preparing to buy the Rockville, MD-based company.

Shares in Orion surged to 17 5/8 in the week after the transaction was announced, just above the $17.50 per share Loral is paying for Orion. Trading volume topped 1.7 million shares.

At our deadline in mid-October, Orion's stock was trading at $18.

Officials expect the transaction to be complete within four months, after the FCC and Orion shareholders have approved the deal. The merger also must pass muster with the Justice Department.

Once the deal is complete, Loral will retain Orion as a separate entity. This means that Orion's more than $700 million in debt, incurred to finance a pair of new satellites, will be serviced by Orion's cash flow. Loral believes that Orion's revenues will increase from approximately $75 million in 1997 to $137 million in 1998.

In addition, a joint venture of Loral and its Mexican partner, Telefonica Autrey, has been selected as the winner of the auction to acquire a 75 percent stake in Satelites Mexicanos, S.A. de C.V. (Satmex). Satmex's assets consist of three operating satellites, Morelos 2, Solidaridad 1 and Solidaridad 2, along with tracking, telemetry and control sites in Mexico City and Hermosillo, Sonora. Mexico's Communications and Transport Ministry announced that the bid of $688 million submitted by the joint venture was the winning bid for the privatization of Mexico's satellite operations.

INDUSTRY REFLECTS ON SPUTNIK IMPACT

The satellite industry celebrated a significant milestone in October with the 40th anniversary of Sputnik, the first man-made object to orbit the earth, launched on October 4, 1957. The Smithsonian Institution in Washington, DC, honored this historic accomplishment by hosting a symposium entitled "*Reconsidering Sputnik: Forty Years Since the Soviet Satellite.*"

During two days of panels that occurred on September 30 and October 1, accomplished scholars from throughout the satellite and space community discussed several aspects of the events surrounding Sputnik that have become apparent as the years have passed. From a perspective of 40 years after these events, new disclosures and the declassification of important documents have revealed new details of the first race for space.

One of the topics discussed was the general attitude of the Soviet public to space research. The panel pointed out that the general public in the Soviet Union was quite knowledgeable about the drive to orbit a satellite, and was even groomed to expect the launch of Sputnik through government announcements, although the exact launch date was never made public before the fact.

Another panel shed new light on the relationship between the public space race and U.S. efforts to initiate a spy satellite program. Recently released documents have led some scholars to suggest that the fact that Sputnik was orbited first played right into the hands of U.S. strategists who wished to establish an "open skies" policy. By placing Sputnik in orbit, the Soviets set a precedent for the United States to deploy spy satellites.

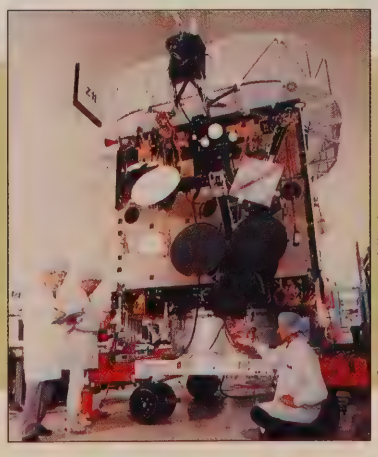

Photo courtesy of Hughes Space and Communications Co.

The UHF Follow-On F8 satellite, the first of three satellites with the new Global Broadcasting Service (GBS) payload, is being prepared for environmental testing at Hughes Space and Communications Co.'s Integrated Satellite Factory. GBS enables troops around the world to receive data rates of 30 Mbps via satellite. Hughes is incorporating the GBS payload onto the last three of 10 UHF satellites it has been building under contract with the U.S. Navy. UHF F8 is scheduled for launch in the first quarter of 1998.

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11	33	55	77	99	121	143	165	187	209	231	253
12	34	56	78	100	122	144	166	188	210	232	254
13	35	57	79	101	123	145	167	189	211	233	255
14	36	58	80	102	124	146	168	190	212	234	256
15	37	59	81	103	125	147	169	191	213	235	257
16	38	60	82	104	126	148	170	192	214	236	258
17	39	61	83	105	127	149	171	193	215	237	259
18	40	62	84	106	128	150	172	194	216	238	260
19	41	63	85	107	129	151	173	195	217	239	261
20	42	64	86	108	130	152	174	196	218	240	262
21	43	65	87	109	131	153	175	197	219	241	263
22	44	66	88	110	132	154	176	198	220	242	264

A. What best describes your firm's primary business? (check only one)

End User (Corp./Comm./Indus.)
- ❑ 01. Computers
- ❑ 02. Financial
- ❑ 03. Healthcare
- ❑ 04. Hotel/Lodging
- ❑ 05. Petroleum Retailer
- ❑ 06. Retailer
- ❑ 07. Transportation
- ❑ 08. University/School
- ❑ 09. End Users (Corporate/Commercial/Industrial)

Broadcasting and Cable
- ❑ 10. TV/Radio Broadcasting (AV/Film Post Production and Broadcast Facility)
- ❑ 11. Cable TV/Private Cable
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- ❑ 32. Financial Institutions
- ❑ 33. Consultant
- ❑ 34. Legal Services
- ❑ 35. Insurance
- ❑ 36. Brokers
- ❑ 37. Investors

Affiliated Organizations
- ❑ 17. Technical Service (Engr./Design)
- ❑ 20. Foreign or Domestic Govt. Agency (NASA/NASDA/ESA/PTT/Military)
- ❑ 21. Other (specify) _____

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- ❑ 23. Vice Pres./General Mgr.
- ❑ 24. Mktg./Sales Mgmt.
- ❑ 25. News/Program Director
- ❑ 26. Engineering Mgmt./Tech.
- ❑ 27. Operations Mgmt.
- ❑ 28. Purchasing Mgmt.
- ❑ 29. Communications Mgmt.
- ❑ 30. Network Mgmt.
- ❑ 31. Other (specify) _____

C. Number of employees at your location?
- ❑ 38. 1-20
- ❑ 39. 21-50
- ❑ 40. 51-100
- ❑ 41. 101-500
- ❑ 42. 501-1000
- ❑ 43. 1001 or more

D. In the next 12 months, what satellite transmission services do you plan to buy? (Check as many as apply)
- ❑ 44. Audio Transmission
- ❑ 45. Data Transmission
- ❑ 46. Uplinking/Downlinking
- ❑ 47. Internet Transmission
- ❑ 48. Mobile Uplinking/Downlinking
- ❑ 49. Satellite Newsgathering
- ❑ 50. Teleconferencing and Videoconferencing
- ❑ 51. Video Transmission

E. What is your monthly transmission services expenditure?
- ❑ 52. Up to $10,000
- ❑ 53. $10,001 - $25,000
- ❑ 54. $25,001 - $50,000
- ❑ 55. $50,001 - $100,000
- ❑ 56. Over $100,000

F. In the next 12 months, what satellite products do you plan to buy? (Check as many as apply)
- ❑ 57. Adapters/Converters
- ❑ 58. Amplifiers
- ❑ 59. Antennas
- ❑ 60. Cables/Connectors
- ❑ 61. Earth Stations
- ❑ 62. Feeds/Feed Systems
- ❑ 63. Modulators/Demodulators
- ❑ 64. Filters
- ❑ 65. Power Supplies/Products
- ❑ 66. Multiplexors/Modems
- ❑ 67. Transceivers/Receivers
- ❑ 68. Shelters/Shielding/Mounts
- ❑ 69. Satellite Newsgathering Vehicles
- ❑ 70. Software
- ❑ 71. Tele/Videoconferencing Systems and Products
- ❑ 72. Test Equipment
- ❑ 73. VSAT Systems
- ❑ 74. Internet Products
- ❑ 75. Digital Video Systems
- ❑ 76. RF Switches

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H. In the next 12 months, what satellite technical services do you plan to buy? (Check as many as apply)
- ❑ 82. Needs Assessment, Site Survey and Prep.
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- ❑ 85. Frequency Coord. and License Preparation
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- ❑ 95. Recommend
- ❑ 96. Specify
- ❑ 97. Evaluate
- ❑ 98. Approve
- ❑ 99. Not involved

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- ❑ 99. Not involved

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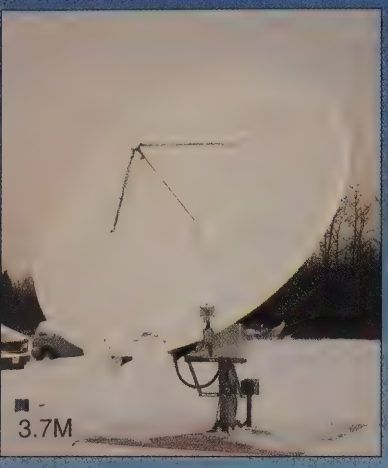

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4-7 Cairo '97 Telecomp, Cairo, Egypt (+20/2-4-14-88- 45; fax: +20/2-4-17-13-71; e-mail:fairtrade.messe@t-online.de)

9-10 Introduction to Satellite Technology, London (800/777-5006 or 301/424-3338; fax: 301/309-3847)

9-11 Broadcast, Cable and Satellite India '97, New Delhi, India (+91/11-462-2710; fax: +91/11- 462-3320; e-mail: exhibind@giasd101.vsnl.net.in; Web: www.exhibitionsindia.com)

11-12 Multimedia Via Satellite, London (+44/171-438- 742424; e-mail: gwalker@phillipsltd.co.uk

1998

JANUARY

11-14 PTC '98, Honolulu, HI (808/941-3789; fax: 808/944-4874; e-mail: ptc98@ptc.org)

15 Satellite Basics (held in conjunction with PTC '98) Honolulu, HI (800/777-5006 or 301/424-3338; fax: 301/309-3847)

26-29 ComNet '98, Washington, DC (617/769-8950; fax: 617/769-8982)

26-29 Cable & Satellite Television in Latin America, Miami

SATELLITE 98

(800/882-8684; fax: 201/256-0205; email:info@iqpc.com)

FEBRUARY

17 Satellite Basics, Washington, DC (800/777-5006 or 301/424-3338; fax: 301/309-3847)

17 Satellite Finance and Investment Summit, Washington, DC (800/777-5006 or 301/424-3338; fax: 301/309-3847)

18-20 **SATELLITE 98: THE ROAD AHEAD**, Sheraton Washington Hotel, Washington, DC (800/777-5006 or 301/424-3338; fax: 301/309-3847;

WHO READS VIA

At an evening celebration hosted by Spacevest, C.J. Waylan, president and CEO of Constellation Communications Corp., takes a moment to read *Via Satellite*.

We build the satellites to fuel Asia's growth.

Space Systems/Loral is hard at work supplying all types of communications satellites which Asia needs to sustain its growth. This includes network, cable and direct broadcast video; fixed and mobile telecommunications; air traffic control; weather, and navigation.

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Circle Reader Response 8

Regulatory Review

The Frequency Band Puzzle

by Gerald E. Oberst Jr.

With the ink hardly dry on Ka-band licenses, the U.S. satellite industry has requested FCC authorizations for an entire flock of new satellites to operate in the 40 and 50 GHz range. This range of frequencies is variously referred to as the V-band or the Q-band. Hardly anyone, however, knows what these alphabetical references mean and there is disagreement over which letter to use for these new applications.

FREQUENCY	BAND
1 to 2 GHz	L-band
2 to 4 GHz	S-band
4 to 8 GHz	C-band
8 to 12 GHz	X-band
12 to 18 GHz	Ku-band
18 to 27 GHz	K-band
27 to 40 GHz	Ka band

In light of this imprecision and the lack of agreement over what the letter designations really mean, it seems that the best approach might be to avoid using them whenever precision is required.

Searching on the Internet is not much help. For instance, many of the Internet "hits" on the term "V-band" turn up references to the King George V Band Club, which has a long history of swinging church tunes in Mqabba, Malta. The FCC itself tends to cite the specific frequencies involved. It usually refers to the "4/6 GHz," or the "12/14 GHz" bands, which the rest of us call the C-band or Ku-band, respectively. We turned to satellite engineers to find out the true story behind these alphabetical names.

One of the best stories we heard was that military planners used these codes in the early days of microwave and radar technology. These codes were set, the story goes, to hide the specific frequency ranges that were being developed for radar systems. Thus, the designation "C-band" covered the basic carrier frequencies, the "S-band" was for secret use and the "X-band" was so top secret that nobody knew for what purpose it was used.

Alas, the story is only apocryphal and there is no specific meaning assigned to each of the letter designations. We confirmed from several satellite engineers and basic texts that the letter designations were assigned at random, as part of government security during the war years. Thus, the letters do not stand for anything in particular, but were merely codes first devised more than 50 years ago.

Jorn Christensen in a March 1995 *Via Satellite* article listed standard designations from the Institute of Electrical and Electronic Engineers. The 1 to 2 GHz range is called the "L-band," the 2 to 4 GHz range is the "S-band," the 4 to 8 GHz range became the "C-band," the 8 to 12 GHz range is the mysterious "X-band" which continues to be used mainly for government and military services, the 12 to 18 GHz is the "Ku-band," 18 to 27 GHz is the "K-band," and 27 to 40 GHz is the "Ka-band."

Accounts vary, however, on the exact boundaries and definitions of some of these bands. For instance, some overlook the K-band altogether, and in researching this topic, I found three different definitions of what was taken to be the Ka-band, some overlapping or replacing the K-band.

The Ka-band appears to be the bridge between spectrum ranges, since it starts within the microwave range and extends beyond 30 GHz, where microwaves stop. Between 30 and 300 GHz, the spectrum is known as the "millimeter wave band," which refers to the wavelength of radio signals between 1 and 10 millimeters.

No one seems to agree on what to call the 40/50 GHz range that received such attention in the recent FCC applications. One source claims that the Q-band is from 36 GHz to 46 GHz and the V-band is 46 GHz to 56 GHz. This definition would make some of the applications overlap the two bands. One solution that some applicants propose is to refer to the generic term for the millimeter wave band, which is the "Extremely High Frequency" range, or EHF. This name is a continuation of yet another series of terms, which for example define the frequency range used by television broadcast stations as the familiar "Very High Frequency" (VHF) and "Ultra High Frequency" (UHF) ranges.

These letter designations and various high frequency ranges normally are far too imprecise to be used for regulatory purposes, and instead are used only as shorthand terms for spectrum bands. The precise frequencies are defined by the International Telecommunication Union and national technical rules, and are set forth in detailed tables of allocations.

The recent satellite applications to use the EHF frequencies are only the latest in the series. We look forward to the use of the "Tremendously High Frequency" (THF) radio spectrum from 300 GHz to 3,000 GHz. These THF frequencies are not allocated in the ITU table of allocations, which today stops at 275 GHz, but permits experimentation as high as 400 GHz. Nor do there appear to be specific letter designations for this spectrum, which seems a pity. Nevertheless, the name alone is appealing and invites speculation on how soon innovations in technology will permit using this highest range of radio spectrum for commercial purposes in the next century.

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Circle Reader Response 9

VS12

1997 THE YEAR IN REVIEW

by Sam Silverstein

The year that is about to end was a frenzied one for satellite operators, manufacturers and investors the world over, and it was equally busy for regulatory bodies eager to invite competition into long-closed telecommunications markets.

The year began with corporate and government officials in the United States hard at work finalizing the multi-billion dollar mergers that brought together Hughes Communications Inc. and Panamsat Corp., as well as Loral and AT&T's Skynet unit. Together, the deals forever changed the satellite industry, as they combined established satellite companies with innovators eager to profit from the fast-growing international satellite communications business.

Loral originally agreed to pay $712.5 million for Skynet, but the companies agreed to a reduced price after the Telstar 401 satellite suddenly died in orbit just three years after launch. The spacecraft's sudden loss left dozens of satellite customers without service, hurting those without non-preemptible service the most. In the end, the catastrophic death of the satellite cost AT&T $234 million, the amount by which it reduced the price Loral paid for Skynet.

After the in-orbit failure of Telstar 401, broadcasters and distance educators had to scramble to find alternate capacity.

Artwork courtesy of Loral.

The $3 billion combination of Hughes and Panamsat went more smoothly, sailing through regulatory channels and becoming official in the summer. But Panamsat was not satisfied with its new market power, and continued to pursue Comsat and Intelsat, demanding that both organizations lose their unique privileges and immunities.

PRIVATIZATION

Throughout the year, Intelsat officials met to work on a privatization plan that would meet favorably with the international consortium's more than 140 member nations. After it became clear that privatization would not occur in 1997, Intelsat delayed final consideration of its future until next year.

Meanwhile, Comsat endured an especially difficult year. Panamsat and the other separate satellite systems—Columbia Communications Corp. and Orion Network Systems Inc.—maintained pressure on Comsat, pushing for congressional legislation that would dangle access to the U.S. market as a carrot to Intelsat to privatize.

But Comsat said the proposed bill, spon-

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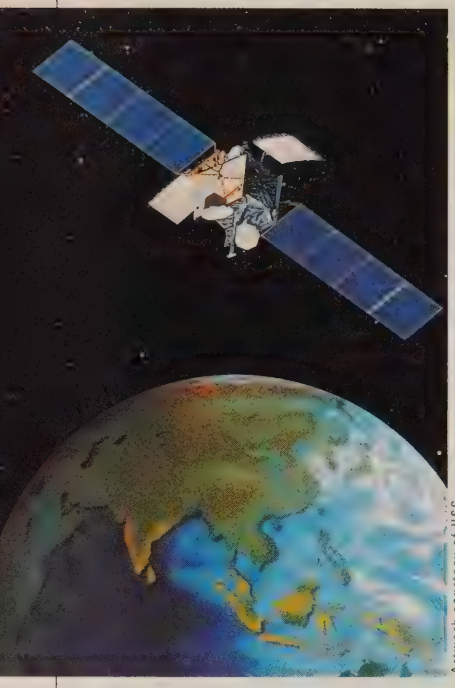

Artwork courtesy of HSC.

Loral expanded its role in the international satellite service market in 1997 with the acquisition of Orion Network Systems, including the Orion 3 satellite (pictured above).

sored by House Commerce Committee Chairman Tom Bliley (R-VA), would cripple its ability to compete and would impose punishing requirements that ultimately could lead to the company's demise.

Moreover, a dissident group of Comsat shareholders demanded that the publicly held company retreat from its money-losing strategy of diversification, threatening a proxy fight otherwise. Under new CEO Betty Alewine, who took over from ousted Comsat CEO Bruce Crockett in July 1996, the company divested its Ascent Communications unit and announced its intention to sell off Comsat RSI.

MOVERS AND SHAKERS

Other corporate maneuvering further altered the satellite industry during 1997. Orbital Sciences Corp. effected consolidation in the satellite construction market with its purchase of CTA Space Systems, a smallsat manufacturer.

Meanwhile, Loral continued its push to solidify itself as a space industry giant with the October purchase of Orion Network Systems for $500 million.

Loral's acquisition of Orion allows Loral to capitalize on the international presence Orion has built, specifically in the field of satellite-delivered Internet services. Orion operates one satellite over the Atlantic Ocean Region, and is building Orion 2 and 3 to serve Europe and Asia, respectively.

Besides bringing business to the already busy spacecraft manufacturers, Orion also caused a frenzy on Wall Street, where investors received the company's January debt offering so well that officials had to decline hundreds of millions of dollars.

Nevertheless, the excitement among investors was evident all year long. Iridium raised hundreds of millions of dollars as it completed its financing and conducted a successful stock offering. Other companies also found the capital, equity and debt markets to be sources of relatively easy money.

MORE LICENSING

Also during 1997, the Federal Communications Commission moved forward with several long-awaited licensing procedures. The FCC auctioned off and issued a pair of digital audio radio services (DARS) licenses, granted two big low earth orbit (LEO) companies permission to build their systems, and issued a report and order detailing how the second round little LEO proceeding will be handled.

Perhaps the little LEO proceeding was most significant, because it was so long in the making. For several years, five companies who participated in the second round of licensing applications to build the data-only systems had waited while the FCC decided how to assign the limited spectrum. Finally, after GE Starsys and CTA Inc. bowed out, the three remaining applicants joined forces with Orbcomm and Volunteers in Technical Assistance (VITA) to submit a spectrum-sharing plan to the FCC, which accepted it and moved forward with licensing.

Meanwhile, the commission auctioned off a pair of DARS licenses to American Mobile Radio Corp. and CD Radio Inc., raising $173 million in the process. In October, the companies finished paying for their licenses and officially were granted authority to build the satellite-based radio systems.

Separately, the FCC gave two more companies licenses to construct big LEO satellite phone systems. The commission decided to waive its requirement that applicants meet certain financial qualifications after the mutual exclusivity issue disappeared amid American Mobile Satellite Corp.'s decision to exit the proceeding.

Now licensed, Constellation Communications Inc. and Mobile Communications Holdings Inc. join Iridium, Globalstar and TRW's Odyssey in the quest to build global telephone systems.

There also was considerable regulatory progress around the world, as governments moved to open previously closed telecom markets. In February of this year more than 60 nations signed an agreement on basic telecommunications at the World Trade Organization (WTO) meeting in Geneva. Many nations will begin permitting greater levels of competition beginning as early as January 1, 1998.

Mexico went even further, deciding to auction off its FSS Morelos and Solidaridad satellites and its valuable direct broadcast satellite slot. As we went to press, Loral and its Mexican partner won the rights to Mexico's FSS satellites .

DBS TURMOIL

The DBS industry was especially tumultuous in the United States this year. Shortly after the year began, upstart Echostar Communications Corp. and giant News Corp. announced plans to merge their DBS interests in what would have created a true competitor to the entrenched U.S. cable television business.

The more than $1 billion merger would have created the greatest concentration of DBS orbital resources in the United States, but it was not to be. Instead, citing irreconcilable differences, the two companies part-

Photo courtesy of CD Radio Corp.

CD Radio Corp. currently has three satellites under construction by Space Systems/Loral for the purpose of delivering satellite radio broadcasts to palm-sized receivers in cars.

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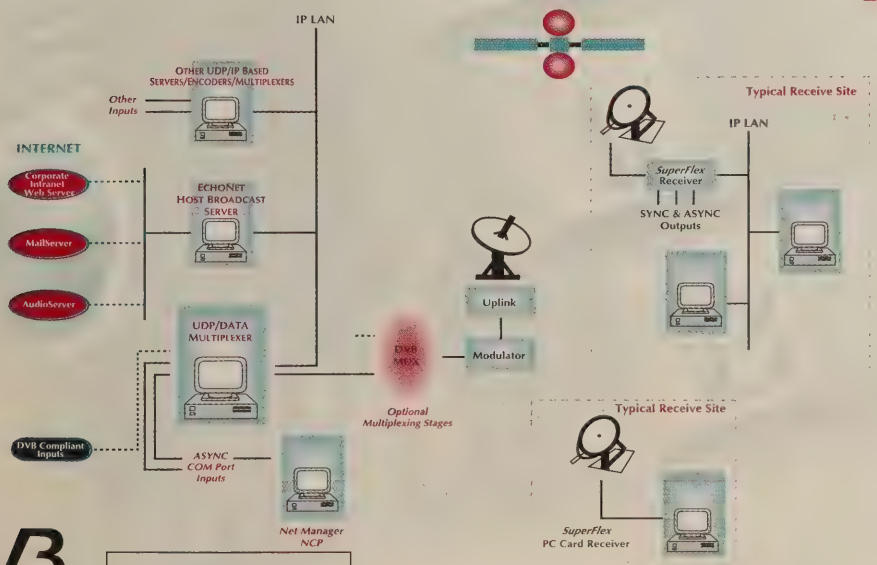

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Artwork courtesy of Iridium

With more than half of its 66-satellite constellation in orbit, Iridium seems well on its way to meeting its commercial service target date in 1998.

ed ways as quickly as they had decided to partner.

But Echostar sued News Corp. for $5 billion, charging that the company had spurned it in favor of a deal with Echostar rival Primestar. Further, Echostar complained that News Corp.'s Rupert Murdoch had discussions with Primestar despite agreeing to a binding contract with Echostar.

Nevertheless, Echostar enjoyed a banner year, as its subscriber roles topped 800,000 by October and its third satellite was successfully launched from Cape Canaveral in the same month.

Primestar also changed dramatically during 1997, altering its corporate structure and integrating News Corp. into the cable-dominated partnership. The company also decided to abandon the medium-power technology it has used since 1984 in favor of more consumer-friendly 18-inch dishes. The move was made possible by News Corp., which contributed the 100°W orbital slot and a pair of high-power DBS satellites in return for a stake in the company.

In other U.S. DBS news, Alphastar Television Network exited the business after its parent, Canada's Tee-Comm Electronics Inc., went bankrupt.

Telesat Canada, meanwhile, announced plans to launch its own DBS satellite sometime in 1998. The launch will finally bring mini-dish satellite TV to Canada.

LAUNCHERS

The launch business also was active during 1997. By October, Arianespace had placed three Intelsat 8-series satellites into orbit as it reached the 100-launch milestone with the launch from Kourou, French Guiana, of Intelsat 803.

Russia's Proton rocket, operating under the auspices of ILS International Launch Services, continued its string of successful commercial launches, placing key communications satellites into orbit, including the PAS 5 satellite for Panamsat. ILS's Atlas rocket continued to meet with success, too, as the launch industry enjoyed an unusually good year nearly devoid of explosive launch failures.

China's often-criticized Long March rocket program regained some of the credibility it lost in 1996 with the fatal failure of the maiden Long March 3B, as two Long March 3B rockets were launched without incident.

But a Delta 2 rocket blew up seconds after launch from Cape Canaveral, raining debris onto the ground and imposing an unexpected delay on the Iridium big LEO satellite project.

Still, Iridium launched more than half of its planned 66-satellite LEO constellation as it moved toward a planned commercial service date of September 23, 1998. In addition to Delta rockets, the company also used the powerful Proton, which is capable of lofting seven satellites into LEO on a single mission.

Even as they continued to deploy proven rockets, the world's launch companies spent the year hard at work on the next generation of vehicles. Boeing's Delta 3 is set for its first launch in mid-1998, as is the Sea Launch project also led by Boeing.

At year's end Arianespace successfully launched its new Ariane 5 rocket. The Ariane 5 failed on its first launch in mid-1996; officials blamed the problem on a software glitch.

The launcher successfully lifted two instrument payloads into geotransfer orbit on October 30. Although lifted into a lower-than-expected orbit as a result of a disturbance in the main cryogenic stage, the payloads' missions were not affected.

A YEAR OF CHANGE

The rapid expansion of the number of satellites in orbit, coupled with multi-million dollar corporate realignments and significant regulatory changes, combined to make 1997 one of the most active years in the history of the satellite industry. As 1998 draws near, the industry shows no signs of letting up. Indeed, dozens of satellites are either under construction or planned, and the long-awaited mobile satellite business is about to take off.

In addition, demand for satellite services continues to grow, given the inherent ability of satellites to provide instant connectivity to even the most remote places on earth. The result very well could be an equally busy 1998.

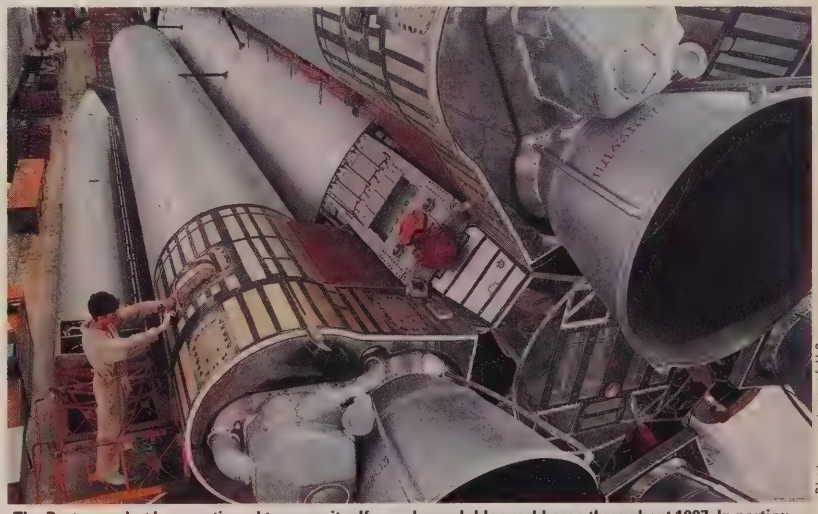

Photo courtesy of ILS.

The Proton rocket has continued to prove itself as a dependable workhorse throughout 1997. In particular, the Russian booster has been pivotal in executing Iridium's system deployment on schedule.

SAM SILVERSTEIN, A CONTRIBUTING EDITOR TO VIA SATELLITE, IS THE EDITOR OF SATELLITE NEWS AND MOBILE SATELLITE NEWS, OUR SISTER PUBLICATIONS.

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Circle Reader Response 12

Rural Teleph

MAKING *the* CONNECTION

Photo courtesy of Comstream

by Kathy McConnell Kessler

IMAGINE, IF YOU CAN, HAVING TO SPEND ONE FULL DAY WITHOUT ANY ACCESS TO A TELEPHONE. THIS MEANS NO PHONE CALLS TO DO BUSINESS, NO CALLS TO SAY HELLO, AND NO CALLS FOR HELP. PEOPLE WHO ARE ACCUSTOMED TO THE CONVENIENCES OF MODERN TECHNOLOGY MIGHT DESCRIBE SUCH A DAY AS SOMEWHAT OF A NIGHTMARE. HOWEVER, THIS NIGHTMARE IS ALL TOO REAL FOR ONE-HALF OF THE WORLD'S POPULATION. THAT'S APPROXIMATELY 3 BILLION PEOPLE WHO ARE FORCED TO LIVE THEIR LIVES WHILE HAVING NO ACCESS TO A TELEPHONE.

In this Information Age where the Internet, paging, and faxing are at our fingertips, the telephone can be ranked as the most basic and rudimentary means of communicating. But it is the lack of this most basic means of communications in rural areas around the world that seriously detracts from the quality of life. Without available telecommunications services, education and health services are limited, and industry is crippled. When they are available, telecommunications become a vital component of any nation's infrastructure. Without advanced telecommunications, a country cannot grow as quickly.

If the world's low tele-density areas wish to take part in the global economy and help educate their populace, they require relevant solutions to serve the needs of local people. As John Cunningham, manager of public relations for Globalstar, puts it, "Through the use of a satellite telecommunications system, a developing nation may be able to jump-start its communications infrastructure and bring itself into the 21st century, leaping from stone-age to space-age."

Satellite networks provide a cost-effective means of rapidly deploying basic telephony to remote areas where terrestrial infrastructure does not exist. Rural communities are, by definition, isolated and widely dispersed. They are often separated from a country's communications infrastructure by distance and difficult terrain, and are characterized by limited social and economic development. Therefore, what these remote areas need is an affordable, reliable network that can be installed faster and cheaper than land-lines. Because fiber or microwave can be cost prohibitive, VSAT technology is often the solution to providing telephony services anywhere around the globe, quickly and cost effectively.

"This is a very exciting time because of the global trend towards deregulation," says Dave Rehbehn, director of marketing at Hughes Network Systems. "And satellite networks are uniquely positioned to be implemented very quickly."

HISTORY

The history of this technology stems from two early developments. First, the development of national and regional satellite services such as Palapa (Indonesia) and Intelsat's Domestic Lease Program (first established between Hawaii and the continental United States in the early 1970s). Secondly, the rural FM/SCPC (frequency modulated/single channel per carrier) products developed in the late 1970s by Hughes Communications, Scientific-Atlanta (S-A) and Harris Corp. served networks in Indonesia (Hughes and S-A), Alaska (S-A) and Africa (Zaire, Algeria, and Gabon for S-A, Sudan and Nigeria for Harris). Additionally, Scientific-Atlanta's FDM/FM (fre-

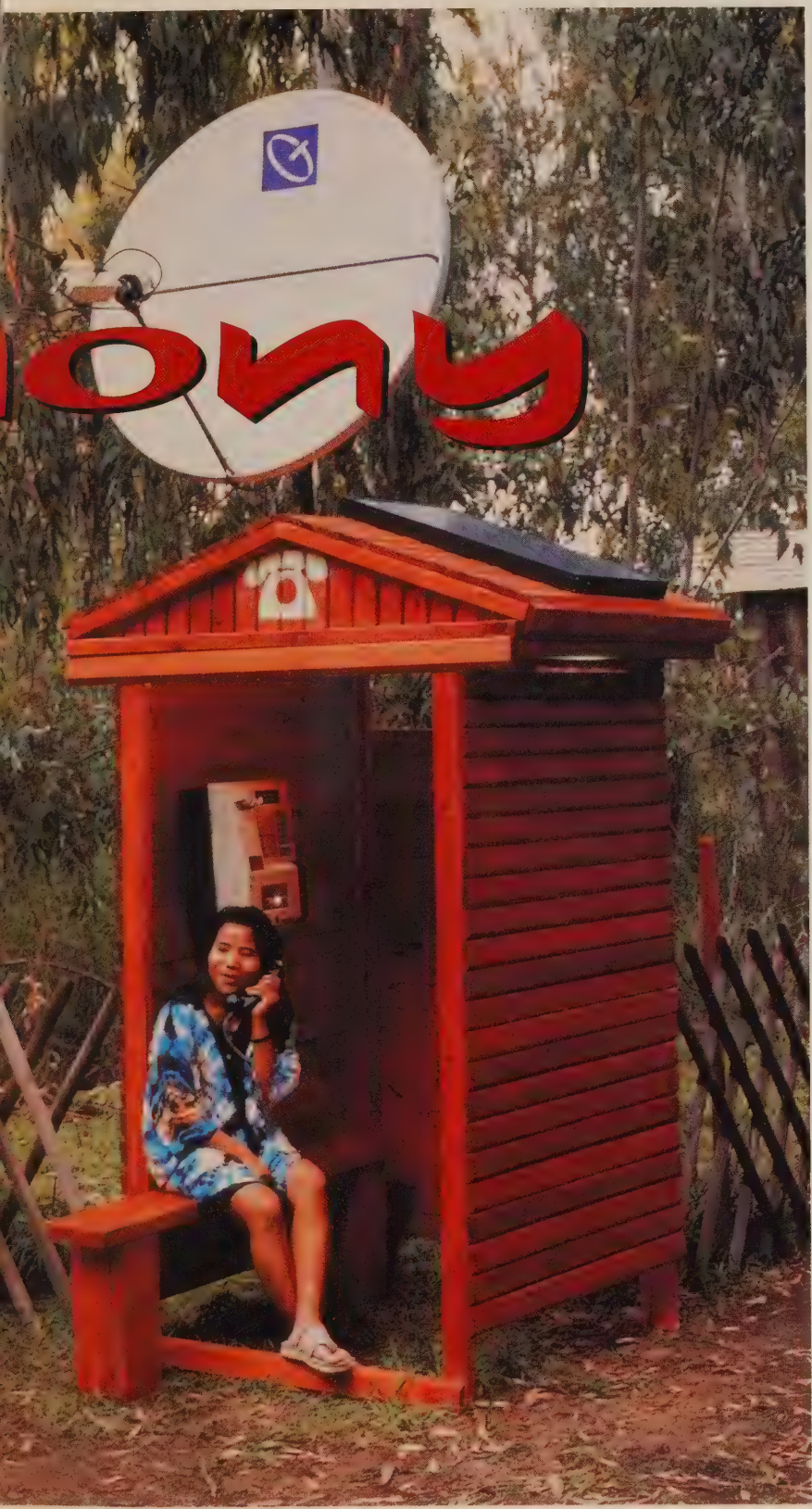

Photo courtesy of Gilat.

The provision of rural telephony via satellite has become such an important market for Gilat Satellite Networks that the company has formed a spin-off, Global Village Telecom B.V., to target this segment. Opposite Page: When the Thailand's TOT wanted a satellite system to supplement its terrestrial-based pay telephone network, Comstream was the vendor of choice.

quency division multiple/frequency modulation) products were used in early domestic-satellite (domsat) telephony services such as Palapa, for larger population areas.

These networks prevailed until the late 1980s when digital SCPC from Hughes Network Systems and Scientific-Atlanta appeared on the international market, first in Taiwan and later in Mexico. Comstream/Spar also had an impact at this time with its TDMA (time division multiple access) product replacing the FDM/FM technology for the higher traffic networks. About the same time, low cost digital satellite multiplexers from PSCI (now Nuera) and ACT Networks, as well as variable rate modems from Fairchild, Comstream, Hughes, and S-A hit the scene that made MCPC (multiple channels per carrier) a viable technology for smaller public and private networks.

Says Macy Summers, vice president of sales and marketing at Telecom International, "In the early '90s came the connection of satellite and cellular. Most notably, Scientific-Atlanta's 300 site Argentinean network changed the traditional 'wired last mile' to wireless. This trend has continued with the advent of wireless local loop [WLL] technology, and satellites continue to fill a niche in developing nations' rural backbone technology."

Analog satellite telephony networks were installed in the 1970s in Alaska and Indonesia. This technology was FM/SCPC and every RF channel had a telephone on it. Says Gerry Einig, director of systems engineering at Scientific-Atlanta, "Alaska and Indonesia presented geographic challenges for traditional terrestrial networks, and Scientific-Atlanta's pioneering satellite technology provided the solution." By the late 1980s, S-A was providing large satellite-based analog telephone systems to PTTs (long distance phone companies) in Africa, Algeria and Saudi Arabia.

Telesat Canada was the first company in the world to launch a domestic geosynchronous satellite. The historic launch of the Anik 1 satellite in 1972, a quarter of a century ago, served to help bridge Canada's vast distances, providing people in northern communities with reliable, clear voice communications.

Says Pierre Lafontaine of Telesat Canada's carrier sales, "Since 1972 Telesat Cana-

Photo courtesy of Globalstar.

Globalstar, one of the leading players in the big LEO market, plans to target developing infrastructures and fixed-site satellite telephones as a major market.

da has launched several new generations of satellites to increase services and maintain the quality that customers expect. And, recent improvements and advances in earth segment technology have eliminated the double hops that used to occur when people in one northern community spoke with someone in another northern community. Calls used to go up to a satellite, down to a master hub station, then back up to the satellite, and finally down to the other party. This was a roundabout route that would add enough delay to make talking a trifle awkward."

New earth station technology avoids this problem by allowing one remote community to talk directly to another. Calls go up to the satellite and then down to the receiving earth station. Callers are, therefore, able to converse much more naturally. The new technology also allows customers to run in-band data (for fax) on their voice circuits or add dedicated high-speed circuits. "The result is flexible, versatile and economical" telephony services, says Lafontaine.

USAGE

A number of companies throughout the world are stepping up to the task of providing telecommunications services to rural areas. Gilat Satellite Networks (Gilat) is one such company that is making great strides in the field of rural telephony. Gilat designs, manufactures, markets and supports VSAT satellite earth stations and related hub equipment and software. Gilat products are incorporated into telecommunication networks, which provide satellite-based communications between a central location and a large number of geographically dispersed sites. Gilat is active in the field as both an equipment manufacturer and as an investor in a spin-off company, Global Village Telecom B.V. (GVT), which specifically targets the provision of telephony services to rural areas.

GVT intends to provide fixed-site rural telecommunications services through the use of VSAT satellite technology developed by Gilat. Joshua Levinberg, acting head of GVT, says, "We will focus on providing basic telephony service in less-developed countries around the world, where a significant percentage of the population resides outside of urban areas and often doesn't have access to a single telephone. The magnitude of this challenge is enormous, and GVT's complete solution, including unique and low-cost satellite VSAT technology, operational know-how, and financial resources are perfectly suited to provide global rural telephony services."

GVT's initial focus is on less-developed countries in Asia and South America, followed by those in Eastern Europe and Africa. Continues Levinberg, "GVT's strategy is to supply service in conjunction with local partners and PTTs in each country. Working hand in hand will assist GVT in obtaining licenses to provide service."

This strategy is already being put into motion, as GVT was recently awarded a license to provide telephone service to approximately 1,200 villages in Chile through an international tender. Fifteen hundred Dialaway sites are being rolled out to fulfill the license. "We're very excited about the license in Chile," says Levinberg, "and expect the sites to be up and running by the first quarter of 1998."

And in Indonesia, a service provider is extending the public telephony network to rural communities. The network includes 200 Dialaway sites for single/dual-channel voice via public telephone kiosks (satellite payphones) and several dozen Faraway sites. "We are using proven technology to provide a very affordable service," says Levinberg. "Our network in Indonesia is up and running and serving people today."

Gilat has invested approximately $15 million to date in the development of the VSAT technology that Levinberg describes, and offers a wide range of products to provide rural telephony services. Two such products are The Dialaway and The Faraway. The Dialaway is a low-cost VSAT system that provides one to two phone lines to satellite payphones in rural areas. The Faraway VSAT offers a multi-channel satellite telephony platform for on-demand voice, fax and data communications.

More than 100 Faraway sites are deployed in Russia, Australia, India and China to provide rural business telephony. The remote users have a LAN (local area network) connection from their most rural branches to the city headquarters. The actual customers benefiting from these sites

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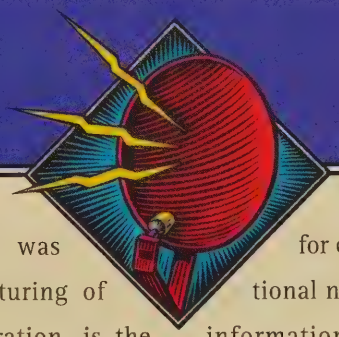

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include corporate offices, mines and banks.

In Canada, some 120 remote locations now use satellite to provide telephone services to northern communities. Telesat Canada is using two domestic satellites (Anik E1 and Anik E2) to provide these services. "Telephone companies, private sector firms, and individuals are all using satellite services," says Lafontaine. "Telephone companies provide services to remote communities, resource industries serve mining camps and oil exploration fields, and individuals provide service to fishing and hunting camps.

"The cost to establish such a satellite service varies with the voice, data or video capacity that's required," continues Lafontaine. "Typically the higher the capacity, the greater the cost. Earth stations can range from CDN $20,000 ($26,000) for moderate sized units to CDN $500,000 ($650,000) and more for large, high capacity switching hubs. The cost to operate the network depends largely on the bandwidth required as well."

Comstream also sees VSAT systems as a practical solution for providing rural telephony services. In a recent rural telephony project, the Telephone Organization of Thailand (TOT) used VSAT Plus 2, a multiservice TDMA VSAT product from Comstream as the core technology in a satellite-based communications network. When fully deployed, the network will include 22 regional gateways, and more than 1,000 remote sites, making it the largest TDMA/VSAT network in the world to date.

Photo courtesy of Comstream

The VSAT Plus 2 product is the system of choice for Comstream's rural telephony customers because it removes the need for a central hub.

Comstream's VSAT Plus 2 has a fully distributed architecture that allows the product to support a range of network topologies, including full-mesh interconnection of more than 1,000 sites, point-to-multipoint networks, star and multi-star networks, and broadcast configurations. An added bonus of the VSAT Plus 2 network is the ability to place calls between remote stations. This is accomplished in a single satellite hop; routing through a central hub is not required. This hubless architecture offers a resilient system with no single point of failure, according to Comstream.

The TOT employs basic pay telephones with coin boxes exclusively within its terrestrial-based network. One of the TOT requirements was that the satellite-based network had to use the same telephones, thus simplifying the sparing/maintenance requirements and minimizing the cost of the pay telephones. This requirement necessitated that all the routing and metering functions be addressed by the VSAT Plus 2 network. To this end, Comstream incorporated the National Dial Plan of Thailand and its associated long-distance rate tables into the VSAT Plus 2 systems. When the user places a telephone call, the VSAT Plus 2 terminal provides metering pulses to control the pay telephone and collect the money as required. The rate tables are fully compliant with the national dial plan and also support time-of-day variations, thus giving the user off-hour discounts.

The extension of telecommunications to rural areas is an urgent priority.

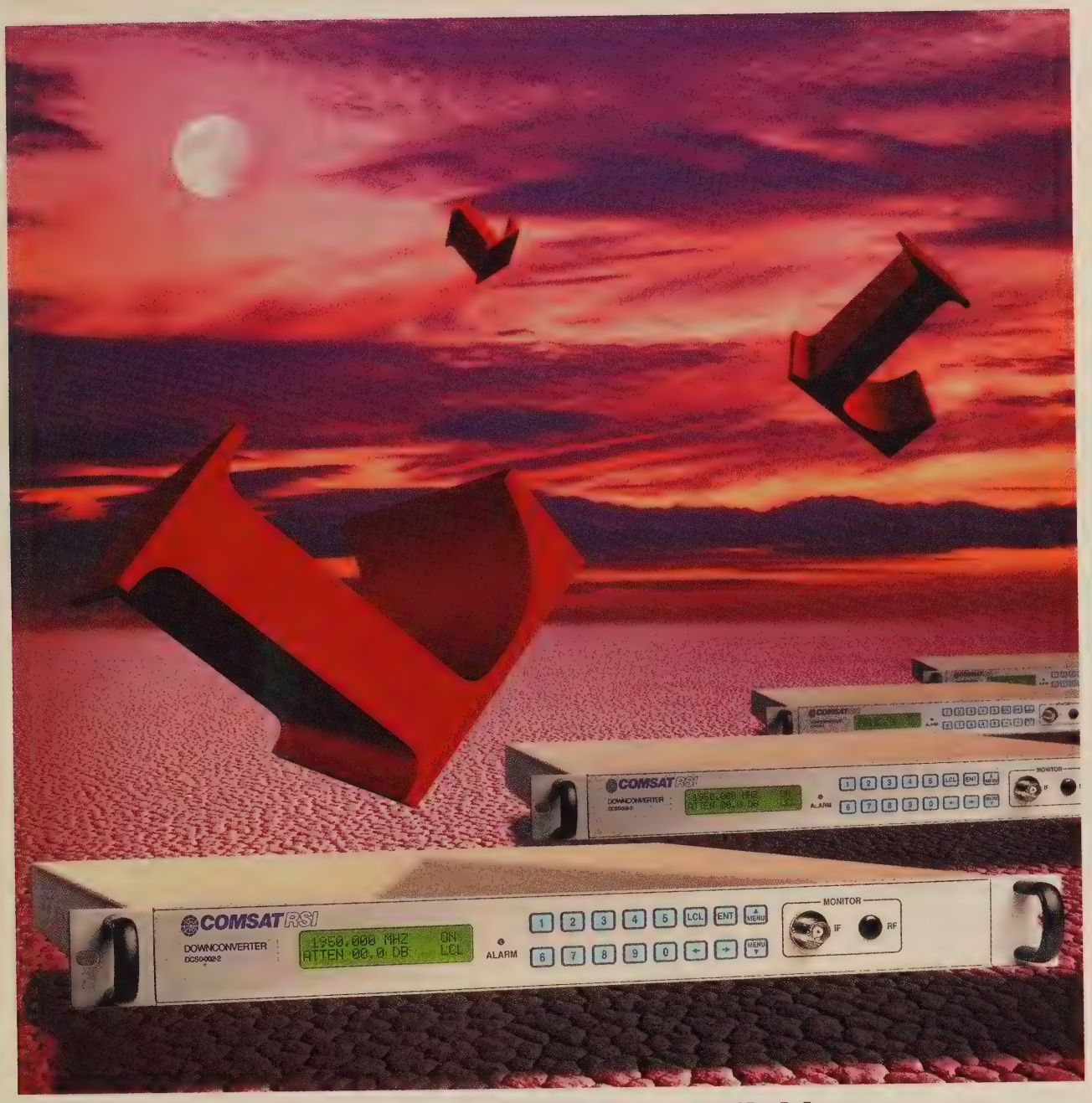
Inmarsat is providing solutions for low tele-density areas with the Inmarsat Rural Phone. Placed in a central point, a local post office for example, an Inmarsat phone is linked to a public call office (PCO), where call bookings, delivery and charging are handled by appointed or franchised administrators. In addition, fax and data services are available. The operator, according to the length of the call, collects call payments. Alternatively, where payphones are deployed, users can purchase a pre-paid calling card or call tokens for a specified value. The PCO is a virtual extension of a country's national telecom network, linked via Inmarsat's satellite system.

Scientific-Atlanta, now in its sixth year of providing satellite telecommunications systems and earth stations to Post and Telecommunication Corp. (PTC) of Papua New Guinea, has been chosen to install four new earth stations and a Skylinx DAMA satellite telephony network in the South Pacific nation.

Since 1991, PTC has been purchasing telecommunications equipment from Scientific-Atlanta for establishing and expanding its domestic satellite service. The new $8.7 million expansion of the network opens new avenues for telecommunications applications and increased services for the more than 4 million residents of the island nation. Inherent with the previous terrestrial-based network were a variety of land-use obstacles, primarily right-of-way disputes. Using satellite communications links will enable the government to locate earth stations on its property and eliminate disruptions and delays associated with establishing terrestrial links on private property.

"In addition to our land-use challenges, we must also deal with very mountainous, rugged terrain covering the majority of Papua New Guinea," says Gerea Aopi, chief executive officer of Telikom (PNG) Ltd, a division of PTC. "Satellite transmissions enable us to negate the impact of our terrain and establish high quality, reliable telecommunications services to our population centers and isolated rural areas."

Microwave equipment, with its costly installation and maintenance expenses, will be replaced with the new Scientific-Atlanta



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Skylinx DAMA telephony network. Currently, the telecommunications network is focused on serving businesses, but the new Skylinx network will provide service to nearly 20 rural areas via one or two channel DAMA equipment. "We anticipate that the number of rural areas we can service with our new capability could grow to 100 sites by the year 2000," adds Aopi. More populous areas will receive eight-channel Skylinx units for handling their heavier traffic loads. Installation of the latest phase of PTC's satellite network is expected to be completed in about two years.

Photo courtesy of Scientific-Atlanta.

Easy-to-install satellite equipment like this dish from Scientific-Atlanta has proven to be a lifesaver for developing nations in need of telecommunications infrastructure.

Globalstar is ushering in affordable, basic telephony through fixed-site satellite telephones to millions of citizens of developing economies. Globalstar is a low-earth-orbiting (LEO) satellite-based digital telecommunications system that will offer wireless telephone and other telecommunications services worldwide beginning in 1998.

Globalstar service will be delivered through a 48-satellite LEO constellation that will provide wireless telephone service in virtually every populated area of the world where Globalstar service is authorized by the local telecommunications regulatory authorities. The first four satellites are scheduled for a December 4, 1997, launch. The remaining satellites are slated for launch throughout 1998.

In remote areas with little or no existing wireline telephony, users will make or receive calls through fixed-site telephones, similar either to phone booths or ordinary wireline telephones. Each subscriber terminal will communicate through a satellite to a local Globalstar service provider's interconnection point—a gateway—which will in turn connect into existing telecommunications networks.

Asia Satellite Telecommunications Co. Ltd., (Asiasat) is Asia's first privately owned regional satellite operator. With its second satellite, Asiasat 2, in service in January 1996, the company is presently serving more than 30 users who operate VSAT networks for voice, data and video transmissions across the region.

With the exception of a few developed countries, most Asian countries suffer from low tele-density. For example, the People's Republic of China has only 3.35 telephone lines per 100 people, and India has just 1.29. As a comparison, Hong Kong has 52.96 and the United States has 62.57. In low tele-density situations, VSATs have become the solution of many Asian countries for rural communications.

Vietnam, for example, with 80 percent of its population living in rural areas, has established its nationwide DAMA VSAT network on Asiasat 2. The network currently consists of a 7.5-meter hub in Ho Chi Minh City and a 4.5-meter hub in Hanoi as well as over twenty 2.4-meter VSAT terminals throughout the country that offer rural telephone service.

TECHNOLOGY

With advancements in electronics and satellite technology, VSAT terminals are shrinking in size, thus lowering the installation cost. Additionally, the deployment of digital compression permits data and video transmitting on a smaller bandwidth. This reduces operating cost, making VSAT operations more affordable even for a larger network.

For example, the 12 large (7-, 11- and 15-meter) earth stations installed by Scientific-Atlanta in the 1970s for the PTT of Gabon, Africa, cost in excess of $20 million. The more recent network installed in Argentina in 1996, also courtesy of Scientific-Atlanta, includes 300 VSAT (2.4-, 3.6-, and 6-meter) earth stations and costs less than $15 million. Finally, satellite has become a viable option for the last mile in rural telephony.

The rural telephony earth station of the future is already taking shape with relative newcomers such as STM, Titan and stalwarts like HNS designing ASIC-based RF and channeling equipment for mass production. Marketers project single orders in the tens of thousands. According to Telecom International's Summers, all these changes are a direct result of the mobile satellite industry's maturation and the bleed-over in technology from L-band services such as Inmarsat and Iridium.

Furthermore, an increasingly competitive environment of terrestrial wireless vs. LEO/MEO wireless vs. fixed L-band satellite vs. GEO satellite has further contributed to a striation of services focused on specific applications in the developing world. All of these technologies are aiming toward the magic number of less than $1,000 per channel, which is a terrestrial rule of thumb.

Whatever satellite system an emerging nation chooses to institute, it is clear that the extension of telecommunications to rural areas is now identified as an urgent priority. A well-developed communications infrastructure can mean the difference between commerce and poverty, unity and dissension, education and illiteracy, and life and death.

Satellite-based rural telephony is the immediate answer to bridging these gaps.

Kathy McConnell Kessler is a freelance writer based in Chicago, IL. She is also a newswriter for Superstation, WGN-TV.

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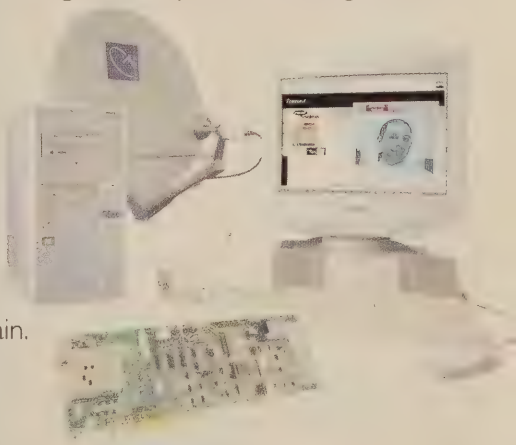

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VSATs

On the Brink of GLOBAL DOMINATION?

by James Careless

Over the past year *Via Satellite* has taken an in depth look at the world's VSAT markets. In that time we've examined the powerhouse that is the North American marketplace, the dynamism of Europe and South America, and the up-and-coming regions of Asia, Africa, and the Middle East.

Photo courtesy of Scientific Atlanta.

One question remains, however: What's going to drive the growth of the global VSAT market? To find out, *Via Satellite* spoke with some of the industry's leading figures.

In doing so, we discovered that all of them predict a future full of possibilities for this industry. Where they differ is in predicting where the best opportunities lie.

VSATs: THE TRENDS

There's one overarching fact about the global satellite market in general: it's growing. In fact, fixed earth station sales "are probably a billion dollar market this year," says Scott Fogle, vice president of marketing and product management for the satellite networks division at Scientific-Atlanta. "I think that's going to double in size in the next five years."

Another key fact: while North America accounts for 80 percent of all installations right now, its share is declining as the rest of the world catches up. In fact, Fogle expects the combined regions of Asia and Latin America to account for "30 to 35 percent over the next four to five years."

So what is happening with VSATs? "First, the technology seems to be getting more competitive and cheaper," says Andrew Werth, president of Hughes Network Systems International. "Second, there seems to be an awakening of non-business applications."

One of the "non-business applications" is "rural telephony for the developing world," says Werth. That's a point with which Ira Kane, Stanford Telecom's vice president of international VSAT sales, readily agrees. During a recent trip to the Philippines, for instance, "I talked to them about putting everything imaginable on a VSAT," he says. "And they said, 'Hey, we have 5,000 islands. We have no telephones on those islands. Please don't talk about that far ahead; please just give us some telephones.'"

The other big opportunity is "the two-way version of DirecPC," says Werth, not just for business users, but for Internet surfers as well. In areas outside the United States, there just isn't the number of reliable return paths needed for Internet access.

For users in Kenya or China, two-way VSAT is an effective way of dealing with this problem. Besides, they can do this using a very asymmetrical up/downlink arrangement, which is efficient yet affordable. That's because the uplink return path can be low bandwidth, since usually what travels along here are just requests for files from

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Internet servers. "So it can be a different kind of beast than what we sell to Walmart or Holiday Inn," says Werth. "Although those links are also asymmetrical, they still end up sending back a lot of data via VSAT."

A third trend is the growing importance of two-way VSATs. Increasingly, users want to be able to talk back, rather than just sit there passively downloading data. This fact is apparent on both the business and consumer sides of the market, says Fogle.

Within this trend lies the impending growth of mobile satellite communications, which expects to target the fixed telephony market to some degree. However, Yoel Gat, Chairman and CEO of Gilat, isn't concerned. "VSATs are a much better fit for the fixed telephony market," he says. "Cost per minute is much lower."

He explains that a fixed satellite transponder can easily carry 1,000 concurrent phone calls. "As opposed to the mobile services, which are proposing from 50 cents to three dollars a minute, it's a few cents per minute with VSAT-based telephony services," says Gat. "In addition, it doesn't require an infrastructure—any GEO can do the job. There is no limit to the number of channels and it is available today."

Photo courtesy of Gilat

Gilat Satellite Networks is one of the leading providers of VSAT technology and a staunch believer in the future of this industry. According to its chief executive the company will remain with VSATs and only VSATs for the foreseeable future.

THE CONSUMER MARKET CASE

The experts contacted by *Via Satellite* all agree that the VSAT industry needs serious volume sales if it's ever going to reach its full potential. So far this hasn't happened, says Peter Gardner, VSAT program director at Channel Master. "They still haven't met the DBS model in terms of 100,000 or million pieces to a particular project," says Gardner. "They're still [being sold] in 10,000-type units, so the real economies of scale that are associated with that high-volume manufacturing are not being realized yet, especially in the antenna side of VSATs.

"They're just not quite there yet. The critical mass has not been reached."

That volume sales are necessary to drive radical growth is unquestioned. That's because such sales would not only push up income, but also cut per-unit cost. This, in turn, will allow more low-end users into the market, driving up revenues even further.

However, the big debate is where such high volume sales can be found. Some, like Simon Bull, senior consultant at Comsys, believe that the likely source is the consumer marketplace.

"Yes, we would love to have a corporate account come along and say 'Right, I want 30,000 units; I want 100,000 units,'" he notes. "But in reality, there aren't many of those kind of people around." Hence, "the only way you really shift massively beyond this barrier is by moving to the consumer market."

But why would consumers buy VSATs? Simon Bull says the answer is multimedia.

Gat agrees. "We at Gilat believe that the Internet market will take the VSAT industry into the consumer marketplace arena," he says, adding that the consumer marketplace will accept a VSAT-based Internet product if it is PC-based, IP-based, DVB compliant and costs under $1,000 in retail locations.

And Gilat is scheduled to release such an Internet product, which will be Ku-band, during 1998.

INTERNET

While terrestrial networks may be a step ahead of the VSAT market in the Internet arena because the infrastructure already exists in many locations, VSAT's do have inherent advantages that may push terrestrial out of the market as VSATs did with point-of-sale networks.

The problem the terrestrial networks have is bandwidth: they don't have enough of it. In contrast, VSATs can offer enough spectrum to deliver full multimedia to home users.

And, according to Bull, while the terrestrial network does offer all the aspects of multimedia systems today, "rarely do you see it in one single package" aimed at consumers.

Of course, current mass market consumer products such as DirecTV and DirecPC are one-way systems. But these companies want to do much more than they are now, he says. "Those digital service providers are looking towards adding data, and at the moment they're constrained because their channel is one-way," says Bull, who sees little reason why they couldn't convert to two-way satellite links, with a little help from VSATs.

But, "Hughes, Gilat, and others are saying 'Well, yes; why don't we marry that technology with our VSATs?'" he says. In this way, "we're already moving towards a capability which is quite far beyond what the terrestrial guys can do."

In fact, Gilat is already installing such a system. The U.S.-based Rite Aid chain will employ 4,000 terminals for its VSAT network. Applications will include business training, music to stores and remote Internet access.

THE CHALLENGES

Simon Bull is the first to admit that many obstacles have to be overcome in order to sell VSATS to consumers. "The question is how you get past the issues of installation, because as soon as you talk about an antenna which is much bigger than 60 centimeters, then installation becomes a lot more of a problem," he says. There are also "the other issues of radiation hazards, frequency

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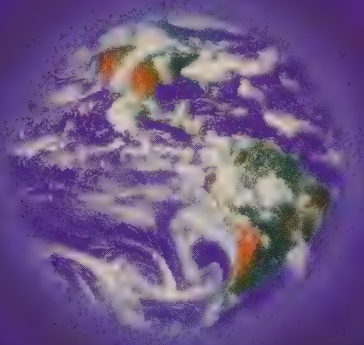

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"YOUR ERROR FREE CHOICE"

Photo courtesy of Stanford Telecom

Stanford Telecom, which manufactures VSAT modems, has found that many opportunities for business lie in "non-business applications" such as rural telephony in developing regions around the world.

assignment, and frequency control monitoring" to contend with as well.

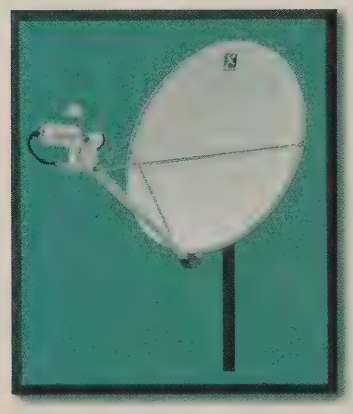
Beyond this, there are simple questions of municipal bylaws. At Comsys' London office, for instance, "we could no doubt get away with putting a 60-cm DTH dish in our backyard. But the chances we could get away with a concrete-based pole-mounted 1.8-meter five watt dish are pretty slim."

However, even if all the laws were relaxed, there would still be other problems to contend with as well. For instance, if "someone came out with a $250 Ku-band VSAT and wanted to sell it through Wal-mart, it would present a major licensing problem," says Bull. "Whether it's the U.S. or Africa, it makes no difference: somebody would have to address that issue."

Finally, if it is expected that VSATs will someday be a consumer product, the world has to deregulate. In all likelihood, a consumer will not travel to a regulatory agency to fill out forms in order to comply with various regulations and directives, pay an appropriate license fee, and register his or her geographic location. "All that kind of stuff can't be possible in a consumer market," says Bull. "There will have to be some type of global licenses."

"I think the pressure to do that will be immense," he continues. The idea sounds unrealistically ambitious—unregulated global VSAT access for consumers—but then "it was not so long ago in the United Kingdom that you needed a license for a TVRO dish. Now you don't.

Because of this, Bull believes that VSATs will make the move from business to consumers eventually, as have cellular telephones and VCRs. "The bandwidth, functionality and the costs of this technology are moving so fast now, that it's almost inevitable that you are going to see consumer products—and you are going to see consumer-type volumes—over the next five years," he predicts. "It's going to happen."



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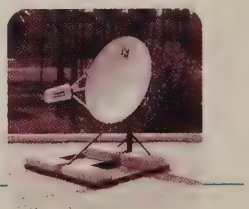

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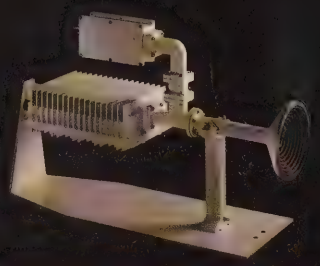

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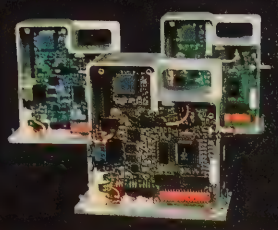

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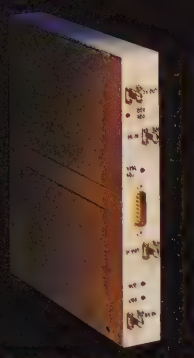

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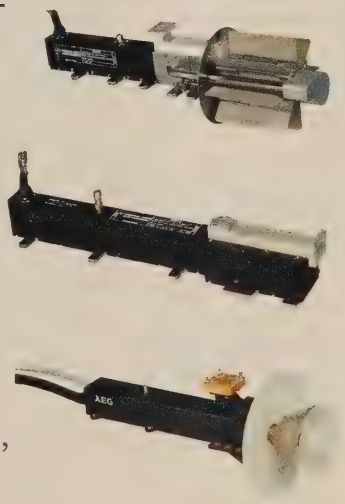

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THE BUSINESS CASE

However, not everyone is convinced that VSATs have much potential in the consumer marketplace. Actually, "the early attempts that have been made to go to the mass market have been lackluster at best," says Gino Picasso, president of GE Capital Spacenet. "In fact, there has been quite a bit of resistance from the public.

"The critical problem is Internet users are not necessarily going to the Internet for entertainment," Picasso continues. "They're going to the Internet for information. And the real question is 'Will the consumers come out *en masse* and start wanting not only higher speed, which is what the satellite offerings can provide, but higher quality?' Not likely. If you're a consumer, and you're just looking for information, you tend to be a little bit more patient with slower terrestrial download speeds."

This is especially true when a terrestrial Internet service provider (ISP) is cheaper than connecting to, for example, DirecPC. Among consumers, cost usually wins out over speed. That's why so many Honda Civics have been sold, and so few Ferraris.

In fact, one limiting factor on satellite-based Internet/multimedia services is consumers' desire to pay the same ISP rates they were paying in 1995, says Picasso, when the whole Internet revolution really took off. "So for the satellite communications business to be able to get into that mass market, there has to be the emergence of a large consuming public that wants to have and is willing to pay for high-quality communications." Right now, Picasso just doesn't see the potential.

Hence, in order to grow aggressively, VSAT installers have to make a bigger push into the business market instead, says Picasso. He adds that they're in a good position to do so, since sales volumes are allowing the reduction of per-unit costs. In turn, lower prices mean that smaller operations are going to be able to afford two-way VSAT technology. For instance, "as costs go down, we believe there's going to be a robust market within the small office/home office, particularly with telecommuting."

Key to this expansion is deregulation. "There continues [to be] a greater and greater need for a service provider to be able to operate on a global basis," says Picasso. To achieve this, governments have got to get out of the way.

As well, satellite service providers have to be ready to provide global services. That's why GE Capital Spacenet acquired AT&T Tridom, Picasso notes, because his company wants to be in a position to do so.

Photo courtesy of Scientific-Atlanta

Scientific-Atlanta sees the VSAT market doubling in size over the next five years, fueled by significant overseas activity.

Beyond deregulation, however, there has got to be enough money in the marketplace to pay for VSATs and VSAT services. Now certainly those costs could be radically lowered on a per-unit basis if someone came in and placed a massive order, observes Werth. For instance, "if you talk about serious rural networks in China or India, you're talking about several million VSATs over the next five years," he says. "With that kind of investment, we can do with VSATS what we've done with DirecTV and DirecPC. We can spend money up front to design customized ASICs and chips, allowing us to drive down per-unit production costs to a more attractive price."

In fact, this has already happened to some degree in the VSAT manufacturing industry already, Werth notes. "I remember when VSATS cost around $15,000 to $20,000. They're now down to about $5,000, thanks to volume production."

Still, convincing people to buy VSATs is still a hard sell in much of the world. Werth describes it as a case of "Show me the money!"

"Where's the guy who is going to say 'If you could sell me a VSAT for $300 that does data and multimedia and Internet, I'll give you an order for 5 million?'" he wonders aloud. If someone actually did this—purchased equipment on the scale of wireline telephones, for instance—"we could get to these numbers."

THE BOTTOM LINE

Although they disagree on method, Bull, Picasso, and Werth all agree on one thing: for global VSAT sales to really explode, some kind of mass market sales has to take place.

For this to occur, government has to back off. To be truly global in scope, the global VSAT industry must be unfettered by cross-border limitations. Only then will satellite carriers be able to provide their customers with the full range of advantages offered by VSATs, and indeed all satellite services.

From the standpoint of 1997, this seems a tall order. The chaos and corruption rife in certain parts of Africa, the weighty and unnecessarily detailed regulations of India, and the still-closed nature of many Mideast, Latin American and Asian countries, all hinder the growth of this technology. To say the least, that's a shame, because VSATs offer solutions to every nation, including the countries that are currently obstructing them.

Still, if the trends of the past few years are any indication, there is hope for the global VSAT market.

The apparently inexorable progress of global deregulation—as slow as it is in some areas—is working to this technology's advantage. And small wonder: even the most repressive of regimes needs hard currency, and nothing generates that better than a healthy business sector. In turn, the key to such health is effective international communications, of which VSATs are an increasingly vital part.

"We're still very bullish about the VSAT market," says Gat. "As a company we will stick with VSATs and only VSATs. We see tremendous growth opportunities."

*(Editor's note: **Via Satellite** will be stepping up its coverage of the VSAT market, with bi-monthly articles highlighting VSAT applications around the globe. To submit story ideas, press releases, etc. fax James Careless at 613/247-0304, or e-mail him at careless@magi.com.)*

James Careless is a freelance writer based in Ontario, Canada.

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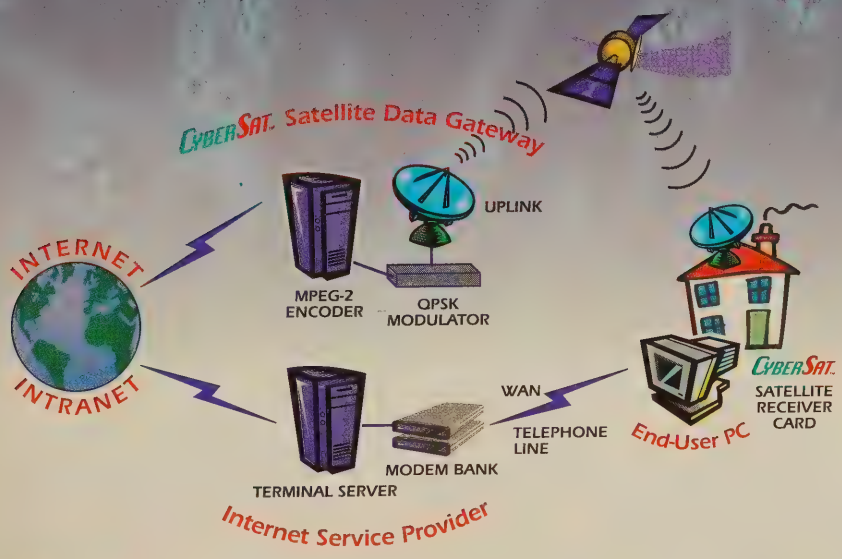

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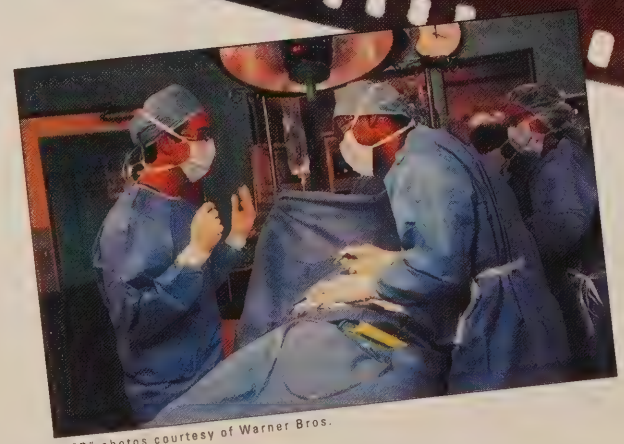
Circle Reader Response 21

SATELLITES *and the* ENTE IND

By Honey Berman

Today's global entertainment industry is pushing satellite technology to the max. NBC's live season debut of "ER," the popular emergency room drama, was satellite at its best. To generate excitement throughout the day, NBC fed its affiliates custom and generic live shots, showing the cast and crew preparing for the live bi-coastal feeds. The segments left Warner Bros. from five paths, arriving via fiber and microwave at the NBC News Channel in Charlotte, NC. The video signals were satellite fed to MSNBC and more than 180 affiliates.



"ER" photos courtesy of Warner Bros.

RTAINMENT USTRY A LOVE STORY

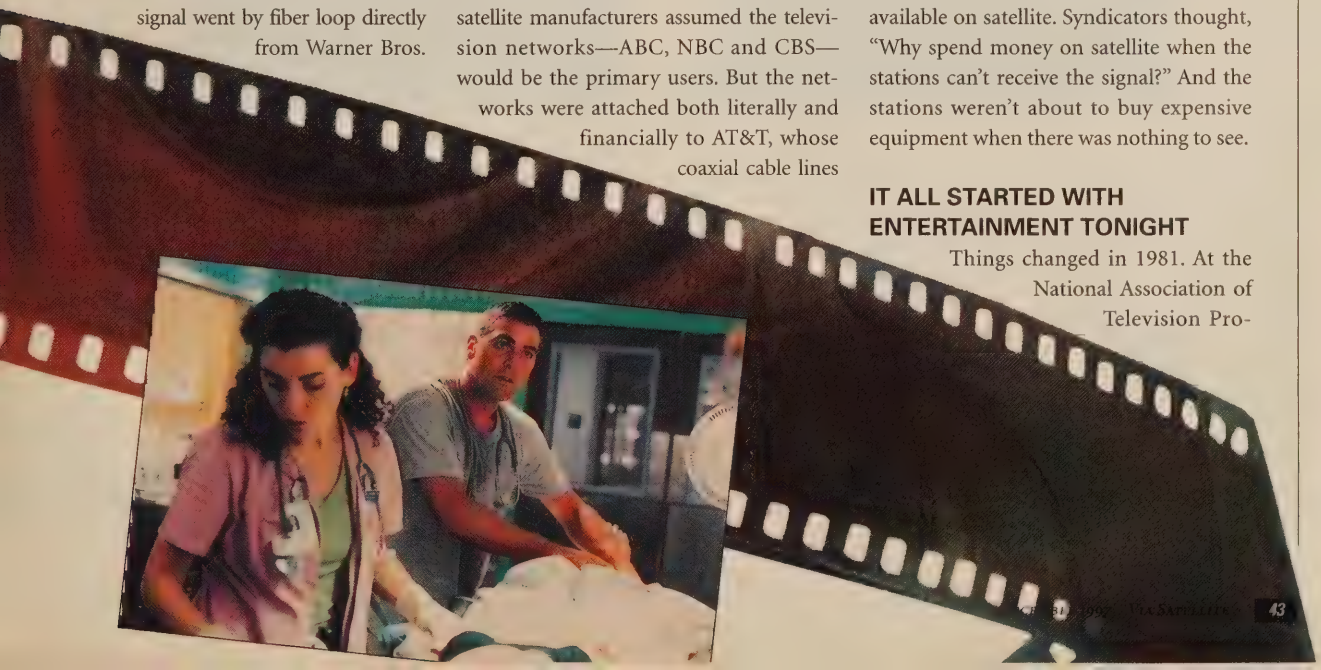
Suzanne Langwell, NBC's traffic coordinator, explained how nothing was left to chance during the two live program feeds. The Unitel production truck fed multiple transmission points, terminating in dual feeds from New York and Burbank, with each studio control center inserting commercials. Warner Bros.' TV1 Circuit delivered an analog video signal to the Pacific Bell fiber switch in Hollywood. Pacific Bell simultaneously transmitted the signal to NBC Burbank, Four Media Co. (4MC) and the Vyvx Los Angeles Hub. Vyvx sent the signal over its digital fiber network to New York. The PSSI mobile satellite truck uplinked a second signal to Satcom K2, a non-NBC bird which New York used for the backup feed. A third signal went by fiber loop directly from Warner Bros. to NBC's Burbank studio. Meanwhile, 4MC uplinked its Pacific Bell signal for the Canadian live simulcast. Completing the picture was France 2. Media Four arranged transmission for the French broadcaster across the Atlantic, downlinking the satellite signal live on Parisian television.

When satellites first became available for commercial use in the 1970s, broadcasters were slow to embrace the technology. The satellite manufacturers assumed the television networks—ABC, NBC and CBS—would be the primary users. But the networks were attached both literally and financially to AT&T, whose coaxial cable lines fed programs throughout the country. Since they and their affiliates already had a distribution system in place, the impetus for satellite use came from the independent stations.

In the late '70s, an independent station's nightly newscast relied on slides or old film clips to cover national and world news stories. Although these stations were thirsting for a way to compete with the network affiliates, no live material was available on satellite. Syndicators thought, "Why spend money on satellite when the stations can't receive the signal?" And the stations weren't about to buy expensive equipment when there was nothing to see.

IT ALL STARTED WITH ENTERTAINMENT TONIGHT

Things changed in 1981. At the National Association of Television Pro-



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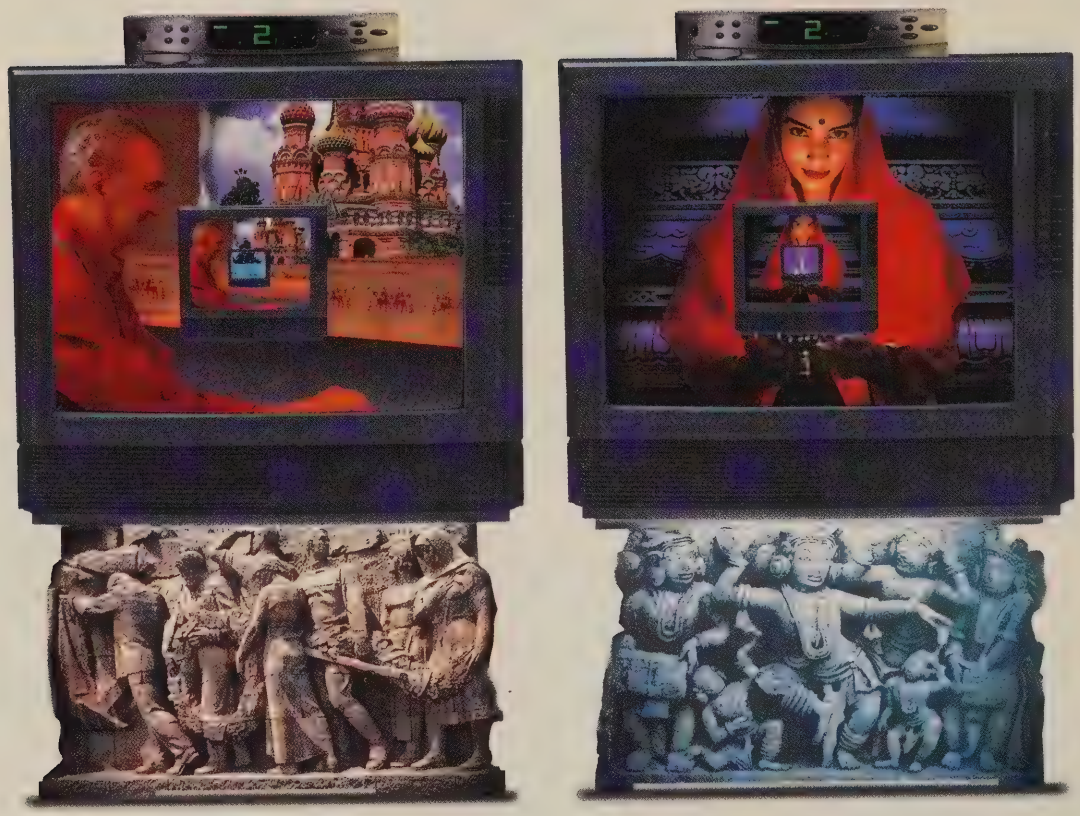

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gramming Executives (NATPE) convention, Paramount Pictures announced it would launch "Entertainment Tonight," an entertainment news program, delivered via satellite. The program had to be produced and distributed for air the same day, due to the timely material. This was an ambitious plan, since the stations lacked the equipment to receive a satellite feed.

Robert N. Wold, chairman and founder of Wold Communications, then a leading distribution services provider, saw an opportunity. He went to Paramount and struck a deal, making a commitment to install up to 50 satellite dishes at designated locations. Wold Communications owned the antennas and Paramount paid a service

© 1996 DreamWorks LLC.

By using Medialink's satellite-based electronic presskit, Dreamworks was able to create a marketing fireball for its first film's world premiere, "The Peacemaker," starring Nicole Kidman (left) and George Clooney (right).

ing contract. About 25 TVROs were quickly installed in various markets, Philadelphia being the largest. Another 25 stations elected to buy the equipment.

"Entertainment Tonight" launched in September of 1981. Within a year, Wold Communications was distributing 80 hours a week of programming for a slew of syndication clients. At first, it was a single transponder, one pipeline, of syndicated programming reaching stations around the country. As the stations installed more antennas the programs migrated to different transponders and satellites. And competition between service providers drove satellite distribution prices lower.

Distributing via satellite made good business sense. It allowed syndicators to schedule ads within the same window in all markets. Syndicators now sold commercial spots to advertisers on a network basis, to air on all stations within a one week period. This spurred the growth of barter syndication, with stations receiving the programs at no charge, in exchange for airing the syndicator's commercials. And it helped attract national advertisers. Even library shows, such as "I Love Lucy" reruns, were up on the bird. Satellite was cheaper than tape delivery, provided clients cleared enough stations (as a rule you needed a bare minimum of 50).

Satellite delivery not only changed the economic formula for delivering syndicated programs and advertisements, it also ushered in the era of time sensitive programming. It took a few years but eventually "Hard Copy" and "Access Hollywood" type shows proliferated. And everyone from Phil Donohue to Oprah Winfrey took advantage of the immediacy of their message, adding topical guests and subject matter.

The continued success of "Entertainment Tonight" is a testament to its ability to change with the times. The same can be said of the show's owner, Paramount Pictures, now a division of Viacom, the parent of MTV, VH1, Showtime, Nickelodeon and co-owner of UPN. Paramount's Phil Murphy, senior vice president of operations, is responsible for distribution of all Paramount shows as well as UPN. Programs originating on the West Coast, plus UPN, are played back internally by Paramount's own facility and then fed to leased occasional uplink capacity from Globecast. Viacom's network operation center in New York originates "Montel Williams" and other East Coast based programs, and rolls backup of all UPN transmissions.

OUTSOURCING AFTER ALL THESE YEARS

Despite these in-house facilities, the studio and its sister channels still outsource many satellite functions. This occurs because of divisional autonomy but is often also a business decision. Investing in the equipment and personnel required to traffic commercials, or produce and distribute live media events, is not cost effective. Viacom's core business is producing programs, not running broadcast centers around the world. So the channels contract out for international network operations.

Viacom is not alone in choosing to outsource part of its satellite distribution. The studios and the broadcast networks all utilize outside vendors, to varying degrees, to support their in-house distribution. Advertisers and their agencies depend entirely on service providers to get commercials into the hands of broadcasters as quickly as possible—sometimes within an hour. These companies maintain the necessary infrastructure to provide both satellite and tape distribution. They often specialize in delivering either commercials, programs or live events.

When Elton John spoke about Princess Diana and the song "Candle in the Wind 1997" during the taping of an episode of

VH1's "Storyteller" series, the programmer felt it was newsworthy. To get the video clip immediately into the hands of television news directors, they called Medialink. The Medialink/AP Express News Circuit, feeding directly into newsroom computer terminals, instantaneously alerted stations to the satellite feed. That evening, the clip appeared on newscasts around the United States. Medialink used the same technology when it produced and distributed clips from DreamWorks' world premiere of "The Peacemaker," the studio's first film. An exclusive agreement with the Associated Press allows the Medialink/AP Express News Circuit to function as the "TV Guide" of satellite news feeds, advising stations of upcoming feeds.

Satellites have changed the economic formula for delivering SYNDICATED PROGRAMMING.

Medialink regularly distributes and monitors electronic press kits (EPKs) for the studios, tracking the encoded video signal via decoders located in U.S. major markets. Jeff Shulman, general manager of its Los Angeles bureau, says Medialink was the first company within the broadcast PR and publicity industry to use this technology to track airings. Medialink recently contracted with ABC Radio Newswire to distribute advisories for audio news releases and radio media tours via satellite to approximately 1,500 radio stations on a daily basis.

In addition to Viacom, Gail Cottman's National Satellite Media Services Inc. (Natsat) is another vendor Paramount Pictures counts on. Natsat's live satellite media tours allow stations to directly interview the scheduled celebrity. Natsat originates as many as five live media satellite tours a day from its studios in Los Angeles, New York and remote locations. They book the talent and produce the interview, as well as handle station notification and distribution. Arranging international feeds is no problem. Whether the scheduled star is in a Rome studio or an Australian broadcaster needs to access the signal, Natsat and its international affiliates accommodate all client requests.

MEDIA TOURS

The newest development in live satellite media tours is the ability to simulcast on the Internet. Natsat's Website offers clients access not only to broadcasters but to PC users around the world. During a recent satellite media tour, while the BBC and China's CTV downlinked the segments from their reporters, the video was live on the Website.

CBS was an early client of Natsat. Today, as a division of Westinghouse, satellite is a mainstay for the company. Cristy Trembly, CBS' technical manager in charge of the transmission area, says the affiliates regularly receive CBS' news and entertainment programs as well as daily promotional feeds. (CBS' satellite channel "Eye on People" is digitally fed from facilities in Connecticut.) The studio control centers provide commercial integration for live programs such as "The Emmy's," "The People's Choice Awards" and "The Rose Parade." Telco landlines bring in the feeds. The commercials are added and the shows are turned around via satellite. "The Tom Snyder Show" regularly schedules live feeds. And according to Trembly, network executives in Los Angeles get a nightly feed from New York of "The Letterman Show" as well as receiving "The Cosby Show" after it is taped before a live studio audience.

Like its sister company Group W Video Services, CBS feeds outside programs as well as its own. Satellite has become a revenue center. Clients include "Politically Incorrect," "The Steve Harvey Show," "Dennis Miller," and "Vibe," among others. Until recently, CBS uplinked the WB network. It also delivers Warner Bros.' "Murphy Brown" series and other programming to the Canadian network licensee, prior to airing on CBS. The Canadian broadcast window is usually one to two days in advance of the U.S. network airing. Since U.S. broadcast signals bleed into Canada, the early window protects the Canadian market.

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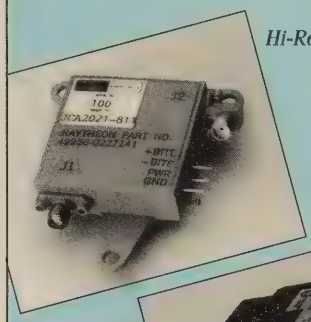

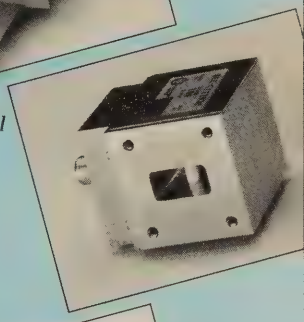

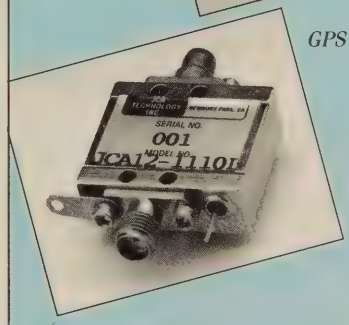

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Circle Reader Response23

SATELLITES BRING WORLD TOGETHER TO MOURN DIANA

The sudden and tragic death of Diana, Princess of Wales, shocked the world, creating immediate and global demand for instant and constant information about the horrible accident, the funeral and the plans to honor her memory.

Photo by Katie McConnell.

News crews staked out Buckingham Palace during the furor over the death of Diana, Princess of Wales, relying on satellites to deliver their live coverage.

Chief among the technologies that enabled news organizations to transmit coverage of the unprecedented series of events that began in Paris early on August 31 was satellite.

With their instant ability to beam information virtually anywhere, satellites took on a special role as Britain and the rest of the world mourned the woman who perhaps was the most famous person on earth.

Indeed, experts say the events of the tragic week made history as the most-watched television event ever. Demand for occasional use satellite capacity was the highest on record.

Transatlantic traffic was especially heavy, said David Gardner, director of media services at Orion Network Systems. Orion doubled the number of staffers taking orders in response to the demand, he said.

Gardner said some customers approached Orion after coming up short with other providers, such as Panamsat Corp. and Intelsat. Orion had three full-time customers between Europe and ➤

For Ken Blaustein, vice president of sales at 4MC, that early window created a sales opportunity. "We pioneered the use of satellite for Canadian transmission with Universal Television in 1982. Universal had a problem, an action adventure show that was running 12 days late and had to be in Canada yesterday. We said, 'Why not feed it to Toronto?' That was the beginning."

Based in Los Angeles, 4MC regularly delivers syndicated programs for clients such as MGM and Bohbot Entertainment, a leading children's programming supplier. Occasionally it feeds MTV music videos to harried producers in Rome or Paris. In Singapore, 4MC Asia originates MTV's Asian channels as well as the MGM Gold satellite channels.

There is no rate card for satellite delivery. "Every satellite job is custom priced since charges vary from country to country. Some countries charge for downlink and recording. With a feed going to Japan, they might say, 'We'll take the feed down but it'll cost you $5,000 to record it.' If a music video has to be in Rome today, MTV will spend $2,500 to get it there. If they have two days, it's sent Federal Express. It's all about time and money," says Blaustein.

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What can be **imagined,** *can be* **achieved.**

Circle Reader Response 25

SATELLITES BRING WORLD TOGETHER TO MOURN DIANA

the United States: ABC, CNN and NBC.

He added that the Orion 1 satellite, the company's only spacecraft, was 99.9 percent booked, forcing Orion to turn down customers who wanted more transponder space.

The crunch did take its toll on the world's broadcasters: Germany's Deutsche Presse-Agentur reported that the ZDF channel had to cancel a planned special on Princess Diana after coming up short in its search for satellite links into Paris and London from Hamburg.

Intelsat Says Orders Rival Persian Gulf War

Although Intelsat no longer is alone in providing global satellite connectivity, the consortium said it still saw demand for capacity that recalled the enormous usage during the Persian Gulf War in 1991.

"Total orders at Intelsat's Operation Control Room increased by a full one-third over the daily average," said Lillian Sy, manager of the organization's Television Service Center.

For the period from August 31 to September 6 (the day of the accident to the funeral), Intelsat booked more than 500 services in large blocks of time, as opposed to the more typical 10-minute news bookings, she added.

Intelsat offered analog and digital services, as well as spotbeams for Ku-band customers.

The Intelsat K satellite provided coverage from Europe to North and South America. Other Intelsat birds brought the images to other parts of the world "I personally never have come across an incident like this that generated as much public interest in as short a period of time," observed Vince Walisko, director of international sales and marketing for Vyvx Inc. "It happened very quickly and we really didn't have any time to react in a normal way, and we used all the capacity in our inventory."

Vyvx's entire transatlantic fiber capacity and satellite space were booked as a result of the Princess' death, said Walisko.

At Columbia Communications Corp., which, like Orion, specializes in transatlantic satellite transmissions, there also was huge demand for satellite capacity, said Ken Gross, the company's president and chief operating officer.

"We experienced significant growth in occasional video traffic," said Gross.

Desperate for Digital

But Gross added that a "significant limiting factor" was the shortage of paths from Central London to the teleports, such as Teleport London International and NTL, which provide uplinks to the satellites.

He said BT Tower, which is the main link between London and the teleports, had been booked solid since the news of Diana's death first became known.

Orion's Gardner concurred, noting that British Telecom (BT) had dealt with the demand by constructing temporary microwave sites that circumvented the overburdened facilities on the tower.

"Everybody's facilities [had] been stretched beyond the limits," said Walisko. "The world in general [seemed] to be concerned and vigilant about this situation." He added that it can take a catastrophic event to convince people that a new technology is more effective.

For instance, the demand for space segment could help boost adoption of digital compression equipment. "This is another situation that is forcing the acceptance of technology," Walisko said. "It's moving the state-of-the-art a little further ahead."

Satellite industry officials noted that the magnitude of the event only partially accounts for the intense demand for satellite capacity to bring the images to the world. The very progress of TV as the technology that unites the world also has prompted people to expect constant, live coverage, thus boosting the need for satellite capacity to meet the demand for information.—*Sam Silverstein*

THE PIONEERS

Blaustein is quick to credit Robert N. Wold's pioneering use of satellite transmission to deliver television programs. Today, Wold's nephew, Robert E. Wold, continues to develop satellite applications as president of Wold International. He assists broadcasters in Japan, China, Europe and Latin America who require satellite transmission and production services for sports, news and special event coverage. In addition to bringing in feeds, Wold also distributes his clients' programming worldwide.

From offices in Japan, Argentina and China, the company acts as a systems integrator—a service provider that marries all of the appropriate carriers and technology together. Typical requests are the broadcaster in South Korea who wanted to cover Mother Theresa's funeral, but did not know how to get a live shot out of Calcutta, or the broadcaster in Taiwan covering a Presidential visit to El Salvador who needed to hire a Spanish crew, do a switched production using five cameras, get the signal out of the country and back to Taiwan. Since 1991 Wold International has been the overseas production and transmission arm for many international broadcasters.

Robert E. Wold believes that changes in international political, economic and regulatory conditions are fueling the demand for satellite technology around the world. As antiquated state-run telecommunications and television monopolies break down, there is a thirst for information previously resident within the controlling monopolies.

Furthermore, viewers internationally want to see their own familiar broadcast faces on camera around the world. "Just as we expected to see Tom Brokaw in London covering Princess Diana's funeral, the same is true in Argentina where they want their announcers on screen covering the elimination matches for the World Cup. And that has spawned an explosion in the use of satellites internationall," says Wold.

Vyvx ADS Global Shuttle, in conjunction with Vyvx International Ltd., is also poised to capitalize on the expanding international market. Already a leading distributor of commercials in the United States, Vyvx now offers digital video distribution service to individually addressable locations between the United States and Europe. With receiver sites in London, Paris and near Munich, clients can electronically send video material and data between the two continents on a digital fiber and satellite path.

20th Century Fox's Home Entertainment Division is using Vyvx ADS Global Shuttle to deliver commercials between Los Angeles and Munich in support of its "Star Wars Special Edition" release in Germany. Peter Lindorfer, director of pre-production for Europe for 20th Century Fox, believes the service will "make a major difference in our ability to meet the requirements for distribution of our home video titles throughout the world."

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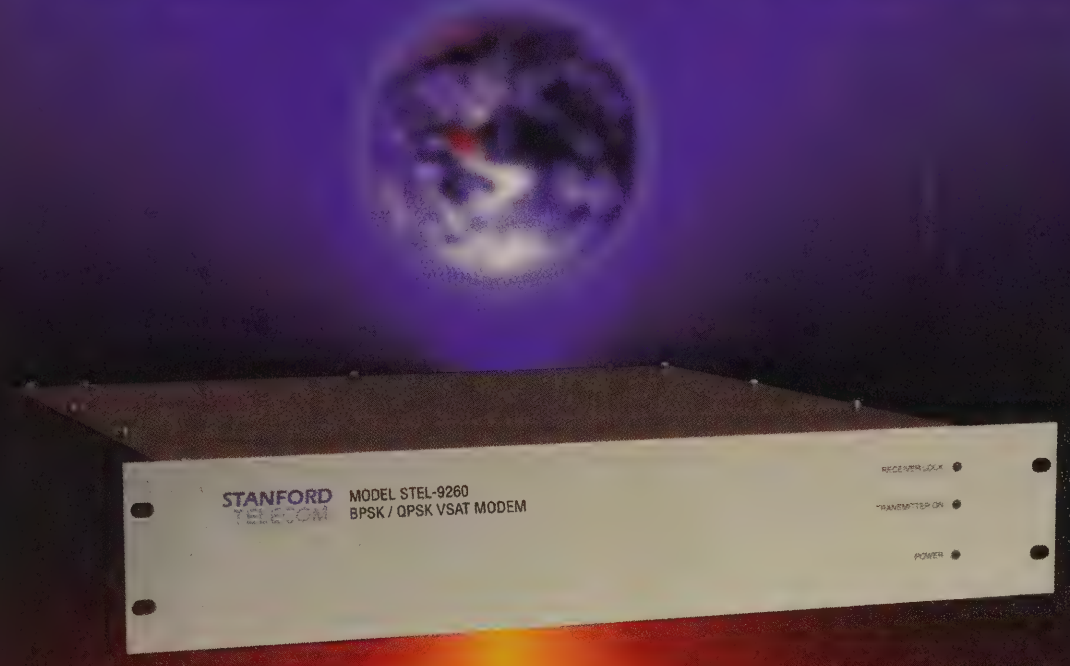

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Circle Reader Response 26

Vyvx expects at least 20 additional international markets to open by year-end, with origination from production centers outside the United States also planned. According to London-based Simon Patch, managing director of Vyvx International, "We anticipate installation to include sites in the Asia-Pacific region, Latin America and key markets which are difficult to reach by conventional means." Since many advertisers and their agencies are multinationals, approval and distribution of ads is expected to be a huge market.

In the United States, Tedd Rosenfeld, vice president of network operations at Fox Digital, the technical arm of Fox Broadcasting Corp., is busy delivering network programming to Fox affiliates. Fox currently leases seven transponders on Telstar 4 and Telstar 5.

SATELLITE *is an* *indispensable* tool *in the* entertainment INDUSTRY.

By geographically dividing the country, Fox delivers regional games of the NFL, Major League Baseball and the NHL. During broadcast, Fox switches the affiliates' receivers, breaking up the country geographically using a Wegener system. They also handle feeds for Fox Television's syndicated programs (4,000 hours annually) and its Canadian deliveries, as well as the Fox Children's Network.

GETTING THE WORD OUT

Sports is a hot commodity at Fox, both domestically and internationally. From football to figure skating, on event days there are as many as eight remotes coming into the facility. Feeds are brought into the network operation center, commercials and promos are dropped in, then refed on Fox's domestic bird.

On the domestic side, when Fox Interactive, a division of 20th Century Fox, built a replica of "The Simpsons'" cartoon house to introduce its "Interactive Springfield CD ROM," Natsat handled the production and distribution. Shots of "The Simpsons" producer/creator Matt Groening walking through the house were fed out nationally.

While Fox is planning its digital future, Digital Generation Systems is already using a digital video delivery system. The San Francisco based company compresses video files using MPEG 2 compression equipment to deliver spots over digital Ku-band satellite to more than 400 U.S. television stations.

Stations receive spots via their DG Systems-supplied Hughes' DirecPC satellite receiver dish. The two-way system checks for errors and provides delivery confirmation. DG Systems' Pentium-based Advantage Digital Video Playback System lets stations view the video, then copy it onto tape via their cart system, or feed it directly into a digital video server.

Since acquiring Mediatech/Starcom, DG Systems distributes spots and syndicated programming for McDonald's, Coca-Cola, Warner Bros. and King World. With offices in Los Angeles, Chicago, New York and San Francisco, Jeff Byrne says the company is eyeing international expansion. But first, it is busy completing the deployment of its network in major U.S. television stations, cable systems and networks.

Los Angeles based Dubs Inc. occasionally sends dailies via satellite, coast to coast, for major studios and editorial companies. According to John Wiseman, vice president of postproduction and features at Paramount, satelliting dailies is rare because of the expense as well as the difficulty assessing film quality. Commercial producers also complain about the cost and inconvenience of using satellite to send rough cuts. They prefer to use video faxes, which unlike satellite uplinks are readily available at postproduction houses, and currently a lot cheaper.

Recognizing the widespread appeal of satellite technology, United Artists Theatre Circuit (UATC) has turned its 2,300 plus screens into the Satellite Theatre Network (STN). Computer software manufacturer Autodesk recently used STN to link 45,000 people at 126 sites in 95 cities. Jim Ruybal, executive vice president at UATC, says, "There is virtually no place on earth we cannot broadcast or downlink for a client. We have coordinated international events that have included locations in Mexico, Canada, London, Singapore and Hong Kong."

Using UATC's patented Electronic Audience Survey System (EASS), worldwide audience members can respond to questions posed by presenters through a response keypad. Within seconds, responses are tabulated and graphically presented to the viewers, creating true interactivity. STN is available in more than 400 locations around the world for corporate meetings, multimedia events, product launches and sales demonstrations as well as concerts and sporting events.

Much has changed since the 1970s. All of the networks—ABC, NBC, CBS, Fox, UPN and the WB—routinely distribute their programs and promos via satellite. Slides and old film clips are long gone, as independent stations receive live news feeds from CNN and Conus Communications. But the biggest change is the dominance of cable television and the rapid growth of DTH. Together, they have exponentially expanded the number of satellite channels delivered into the home.

Satellite remains an indispensable tool in the entertainment industry's distribution arsenal. While it helped level the playing field for independent broadcasters, it also splintered the marketplace by dramatically increasing the choices available to viewers. Satellite's continued popularity has more than fulfilled the expectations of its manufacturers. Heading into the next millennium, digital compression promises to make satellite delivery even more affordable. Channel capacity will expand, bringing additional channels and commercials into our homes. Scanning those 500 channels, each of us is bound to find something that knocks our socks off.

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	at ≥100kHz Offset	−90dBc/Hz
Receive Spectrum Sense (programmable)		Inverting or Non-Inverting
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Available Options	
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IF Interface	70 ±18MHz Standard; 140 ±36MHz Optional

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Circle Reader Response 27

Channels "a go-go"

by Chris Forrester

EACH YEAR VARIOUS PROGRAM MARKETS TAKE PLACE AROUND THE WORLD WHERE PROGRAM-MAKERS MEET WITH BUYERS. AT NATPE, MIPTV, MIPCOM, MIDTV AND MIPASIA, THE BROADCASTERS RENDEZVOUS TO SECURE THE PROGRAMS TO FILL EXISTING AND PROPOSED CHANNELS.

But channels need bandwidth, and even in these digitally-compressed times, the growth in the number of channels is simply staggering. North Americans can be forgiven for wondering what all the fuss is about. After years of over-prediction North America is still well-short of the much hyped "500 channel universe." But not Europe. Europe already has far more than 500 channels, and many more are on the way, helping keep transponder leasing costs and demand high.

Virtually all of the satellite operators serving Europe are planning major expansions of their current orbital positions. And if the recent Cannes Mipcom program market was any indication, that satellite capacity is going to be needed.

THE EUROPEAN FRONT

MipTV and Mipcom are Europe's biggest programming markets. Each generates some 10,000 official delegates.

It would not be an exaggeration to describe Mipcom's activity as "frenzied." Certainly that's the way E! Entertainment Television's Chris Fager describes it. E! has analog satellite programming blocks in most European countries, including a new branded block on GSkyB (Grenada Sky Broadcasting) in the United Kingdom, and has already launched a standalone channel called Estilo in Spain. E! also hopes to launch a full channel in Britain in 1998. Fager says E!'s international channel strategy is to work with a local partner to provide a mix of Hollywood fare

A FORMER SKEPTIC.

Sea Launch is under way. The extraordinary semi-submersible launch pad and command ship are nearing completion and will undergo sea trials later this year. The progress of Sea Launch is remarkable but certainly not surprising. Boeing, RSC Energia, Kværner Maritime a.s, and KB Yuzhnoye/PO Yuzhmash are the world's leading aerospace and shipping companies. As Sea Launch Company, this international partnership is committed to providing a cost-effective, highly reliable commercial satellite launch service to deliver customer satellites to orbit. Hughes Space and Communications International Inc. and Space Systems/Loral have ordered a minimum of eighteen launches. If you'd like to come aboard, please get in touch. Contact www.boeing.com/sealaunch, or call (206) 393-1884.

SEA LAUNCH

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Photo courtesy of E! Entertainment.

E! Entertainment Television provides a mix of Hollywood fare and locally produced shows to most of Europe.

and locally-produced material about each territory's own celebrities and entertainment culture.

E! is a relative newcomer to Europe. Some broadcasters, like Turner's CNN and Discovery, have been around almost from day one of the European satellite age and are looking to launch their Science, Kids and Civilization channels digitally in Europe. John Hendricks, founder, chairman and CEO of Discovery Communications Inc., says the company will be "using satellite to leapfrog the in-ground infrastructure" in Europe.

In September 1996, Discovery announced a multi-year partnership deal with the BBC, which has already led to new channel launches in Latin America for both networks. In addition, Animal Planet is already transmitting from Eutelsat's Hot Bird 13°E position, in the clear over the whole of Europe.

Hendricks adds that as part of his company's digital distribution plan, it will be launching a full HDTV version. Of course, no specific date was given as to when Discovery would launch an HDTV version, just that it will be launched "within 30 days of HBO," which expects to introduce one in the fall of 1998.

Although plans for the launch of HDTV versions of both Discovery and HBO are at best sketchy, Hendricks says he is prepared to "bet the ranch" on HDTV being successful, with natural history programming being a prime motivator for people to buy HDTV sets.

SPEAKING THE SAME LANGUAGE

One of the many challenges facing new channels over Europe is the multiplicity of languages, leading many operators to divide the region into language types.

Fox Kids, which is already on air on BSkyB's analog system, expects to launch over the Nordic region in early 1998. Fox Kids-Scandinavia will migrate to localized language versions to counter the growing competition from indigenous children's channels.

MTV has also split its European feed three ways to more adequately reflect local music tastes as well as to combat the increasing challenges from highly-popular local satellite and cable music channels.

Germany now has a handful of MTV competitors including Viva 1 and 2, and Onyx. For the time being MTV (and VH-1) have the British market more or less to themselves, with only The Box providing real cable competition. That's likely to change, however, in 1998 as a number of wannabees come out of the woodwork, notably the BBC's One TV and Richard Branson's Virgin Group.

The problem for most European niche broadcasters is one of capacity. Either cable distribution doesn't exist or is embryonic. However, sufficient analog satellite capacity from the various "hot bird" positions is also scarce, which makes the few full transponders that do become available highly expensive. Cable is most present in the Benelux countries, some Scandinavian markets and Germany. Yet, in virtually every case cable is treated as a utility, being priced at very low

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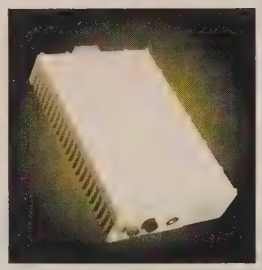

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MUC6770-03	1150-1450MHz	6.725-7.025GHz	10W
MUC140145-02	950-1450MHz	14.0-14.5GHz	2W
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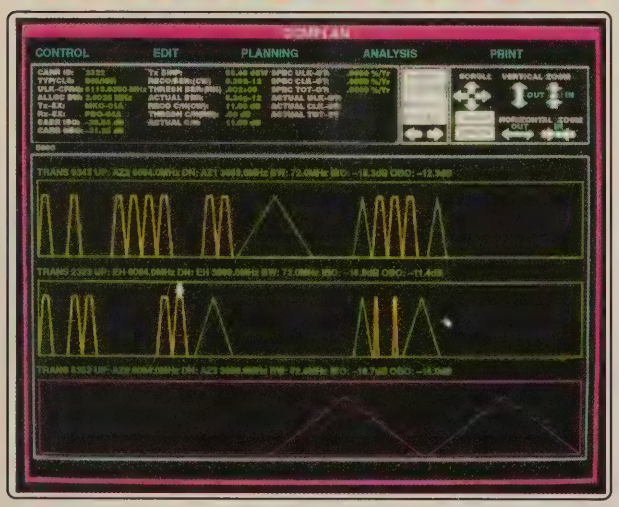

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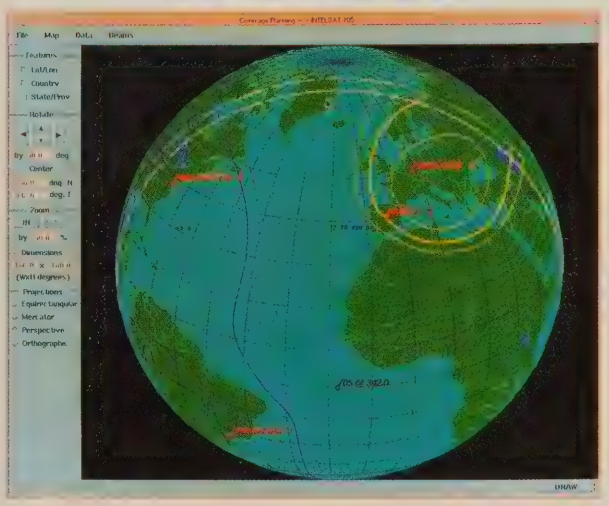

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levels. In Germany, there is no system of collecting carriage fees, with new broadcasters having to rely upon ad revenues.

THE DEAL WITH DIGITAL

Many European players are looking to the North American satellite experience as the digital paradigm. Leo Kirch's launch of his DF-1 all-digital platform over Germany in July 1996 was a disaster, achieving a maximum of only 60,000 subscribers by October 1997. The problem? A reluctant Deutsche Telekom, not keen on carrying DF-1's signals, as well as a reluctant viewing population already awash in a surfeit of satellite and cable free-to-air networks, some 30 channels in all. The argument was simply made: with most of these networks showing a film every night, why should anyone subscribe to a pay service?

This past fall DF-1 merged its operation with film channel competitor Premiere (with 1.6 million subscribers), and has brought Deutsche Telekom into the loop. Subject to regulatory approval, the combined service will come together by March 1998. All existing digital channels, including Discovery (in Germany), will be part of the new service transmitting digitally from Astra at 19°E.

The German public and private broadcasters will also be adding new channels or dual-emitting their current analog services. One million digital receiver boxes have been ordered from Nokia. However, Germany is still embroiled in a debate as to how Nokia's d-Box will reflect the Electronic Program Guides being created by the public networks.

Nevertheless, DF-1's Cinedom near-VOD service is acknowledged as being a model, and priced at just $3.00 (6 German marks), appears to be highly affordable.

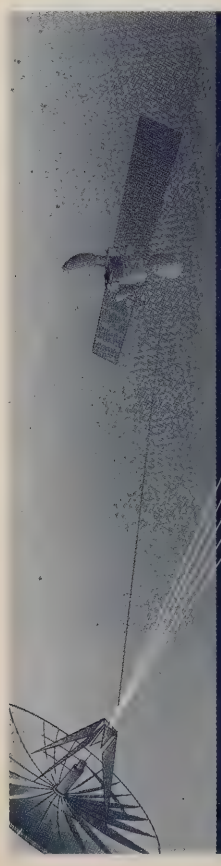
Italy has been a problem market for digital, although there are signs of change. Effectively RAI's (Radiotelevisione Italiano) three public channels will now have broadcasting rights on the restructured Telepiù all-digital system. The restructuring has seen staff levels trimmed and a shareholding swap (Kirch departing, Canal Plus coming in) to give Canal Plus near-absolute control. RAI's first six digital satellite channels (on Eutelsat's Hot Bird 3 spacecraft) have been announced, and their addition to Telepiù's digital bouquet can only help sales.

Already launched are: Raisat 2 for the Children channel on September 28; Raisat 3 for Education on October 13 and Raisat 1 for Performance on October 27. Raisat 4 for News, Raisat 5 for Sports and Raisat 6 for Multicultural are scheduled to launch in 1998.

Carlo Sartori, director of RAI's Thematic Channels division, speaking at Mipcom, says "Digital is ready to take off," adding that television will now move into a pay environment. "By 2007," he says "we should be ready to abandon analog." Strong words, but RAI has always been enthusiastic about the potential extra revenue necessary from new, niche channels to supplement its languishing license-fee income.

One RAI partner is A&E Networks, who will supply a large block of history programming (for Raisat 3) over Telepiù. RAI and A&E expect the satellite-delivered channels will win customer support thanks to RAI's exclusive coverage of Italy's premiere soccer league. However, one recent statement from a senior Telepiù executive says that regarding Division 2 matches "it would have been better to charter a helicopter and take fans direct to the ground for an all-expenses day out, than to depend on income from satellite's PPV buy-rates."

France has a pair of successful satellite broadcasters. The larger operator is Canal



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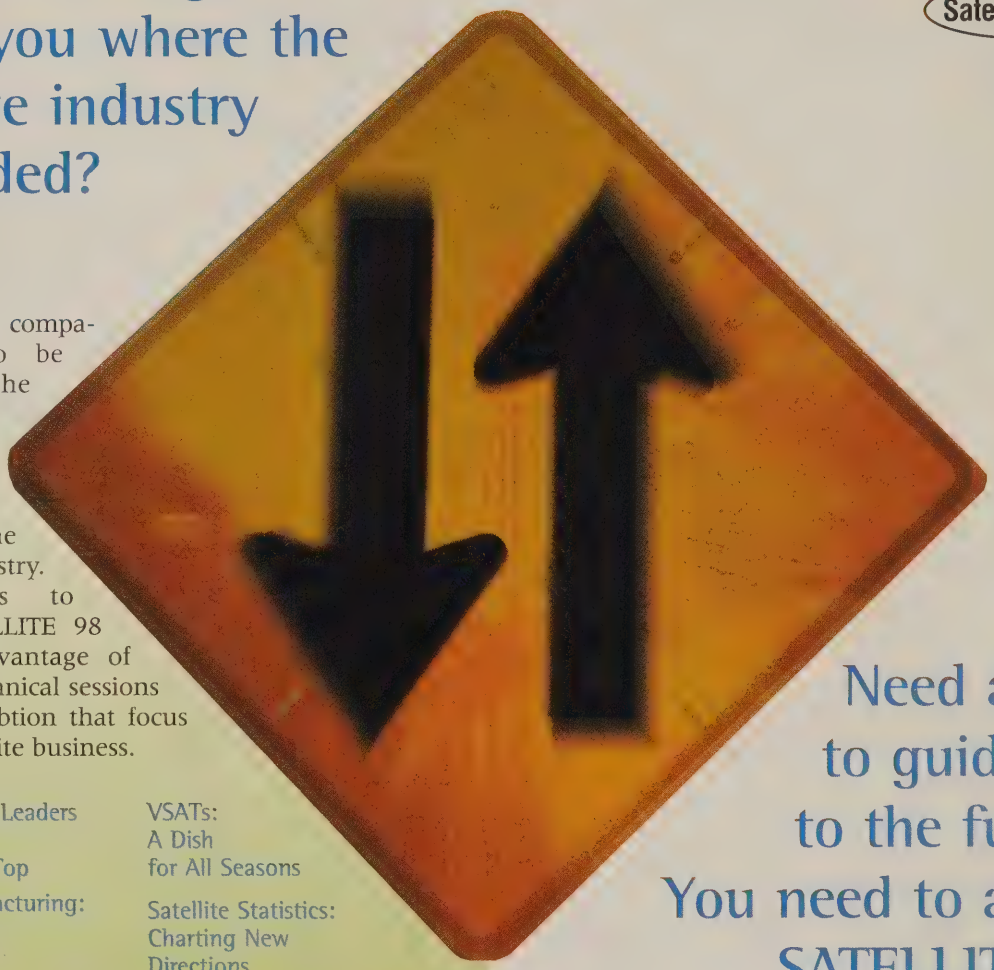

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	9:00 am–5:30 pm	Satellite Finance and Investment Summit
	3:00 pm–7:00 pm	Satellite 98 Registration
	7:00 pm–11:00 pm	Phillips Satellite Group Reception
ednesday ebruary 8 18	7:00 am–5:30 pm	Registration
	9:00 am–11:00 am	Opening General Session
	11:00 am–5:00 pm	Exhibit Hall Open
	11:30 am–2:00 pm	Washington Space Business Roundtable Luncheon
	2:00 pm–5:30 pm	Sessions
	6:00 pm–7:00 pm	SSPI Reception
	7:00 pm–11:30 pm	SSPI Banquet
hursday ebruary 9 19	7:00 am–6:00 pm	Registration
	7:00 am–8:30 am	Exhibitor Forums
	8:30 am–10:00 am	General Session
	10:30 am–12:00 pm	Sessions
	11:00 am–5:00 pm	Exhibit Hall Open
	12:15 pm–1:45 pm	Satellite 98 Keynote Address & Luncheon, 1997 Satellite Executive of the Year Award Presentation
	4:30 pm –6:00 pm	Sessions
	6:00 pm–7:30 pm	1997 Satellite Executive of theYear Reception
riday ebruary 20 20	8:00 am–1:00 pm	Registration
	9:00 am–10:30 am	General Session
	9:00 am–1:00 pm	Exhibit Hall Open
	11:00 am–12:30 pm	General Session

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- ❑ SPECIAL February 18-20, 1998 SATELLITE 98 & February 17, 1998 Pre-Conference Seminar Registration
  - $1,325 *Indicate only one seminar selection:* _____
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  - ❑ Satellite Finance and Investment Summit
- ❑ February 18, 1998 SSPI Industry Innovators Award Banquet
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In Person:
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Plus/Canal Satellite Numerique, rivaled by public broadcaster-backed Television Par Satellite (TPS). Both digital bouquets are doing well. A third platform, AB Sat, is struggling with less than 20,000 subscribers. Canal Satellite Numerique operates from Astra. TPS, transmitting from Eutelsat, offers Arabesque, a bouquet of Arabic channels from Cairo and Lebanon.

Canal Plus, the market leader with 4.9 million subscribers in France (including some 530,000 digital subscribers as of June 30, 1997) has adopted the movies and sports model to drive subscriptions forward. But imaginative niche channels have also emerged, in the form of a new all-digital offering called Canal Satellite Numerique.

For instance, France Courses is devoted to horse racing; Contact Television is a channel featuring a dating service and real-estate segment; Muzzik is an all-performance channel; Paris Premiere (local and regional programming) considers itself vital for Parisians wherever they may live; Spectacle is an original home-shopping channel, supplying interviews with recording artists (to push their CDs or music videos), ballet or opera stars (to sell concert tickets) as well as the usual movie releases; Nostalgie la Tele is video clips, cult shows and some classic concert footage; and Fashion TV is simply nonstop fashion television.

On October 29 Canal Satellite Numerique launched Demain!, perhaps the world's first "job-seekers" channel. Transmitting daily for 18 hours, it will include job vacancies, feature-style programs on how to find a job, improving a resumé, setting up a business and/or finding the right training course.

Canal Satellite Numerique's PPV service is called Kiosque, and features a near-VOD movie service offering a dozen channels ranging from kids programming to action-adventure as well as adult fare. Kiosque is also embracing season-ticket and weekly options for its French soccer league coverage, as well as Formula 1 PPV coverage.

Canal Plus, first with its Italian involvement (from Eutelsat) but also with a platform in Spain (from Astra), has taken on the mantle of "Euro-broadcaster." Besides Italy and Spain it has a large commitment in Poland, perhaps Eastern Europe's most attractive market, and a partnership over Scandinavia with Telenor (from the Thor satellites at 1°W). As the audience builds, Canal Plus promises to "export" many of its niche channels to these new markets. The first sign of this is its link with Tele-Metropole of Quebec to launch technology programming from the Canal Plus bouquet as well as C: (a new channel wholly devoted to "cyber programs"). More will come as Canal Plus believes its niche channels will work as well in the Americas and Japan as in Europe.

BSkyB will launch their all-digital bouquet this spring, probably as a "soft launch" building up to a major push in the fall of 1998. Space has been reserved on 14 transponders from Astra's new orbital position at 28.2°E. The company is expected to dual-illuminate all its current channels, which includes full channels for many existing services, taking the total to around 200 channels when near-VOD channels are included.

In reality, each European country is a long way off from the "500 channel" environment. But take each country as a potential market for 50 to 75 satellite-delivered, digital channels and the 2,000 channel universe already exists.

LONDON-BASED JOURNALIST CHRIS FORRESTER SPECIALIZES IN ALL ASPECTS OF BROADCASTING. HE CAN BE REACHED AT 100334.2056@COMPUSERVE.COM

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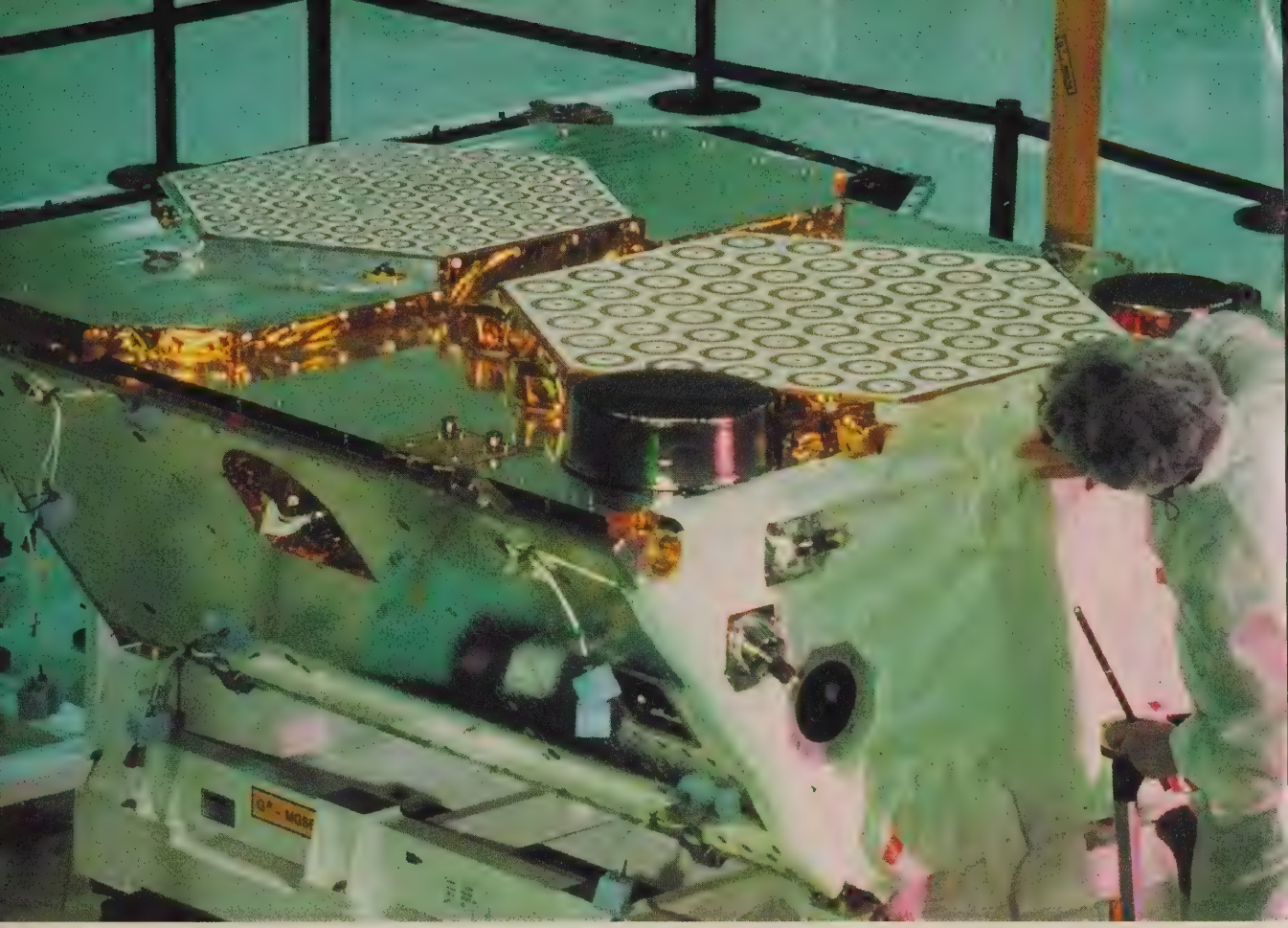

TELECOMMUNICATION SATELLITES.

The Space Division of Alenia Aerospazio has long and wide experience in designing and building complete satellite telecommunication systems. Three decades of continuous technological growth have been marked by important successes in national and international programs, such as ITALSAT F2 and NAHUELSAT. Alenia Aerospazio is building SICRAL, an Italian military telecommunications satellite system and is rapidly expanding its presence in the commercial world market with advanced programs, such as GLOBALSTAR, a 56 low-Earth-orbit satellite constellation and EuroSkyWay, the new European satellite system for multimedia services.

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Industry At Large

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Page 64 . . . . .Services
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People

GENSYM

Appoints Senior Vice President

Gensym Corp. has appointed Stephen R. Quehl as senior vice president of worldwide field operations. Quehl succeeds William H. Wood who has served as acting vice president of sales since July 1997. Wood will continue in his role as vice president and general manager of Gensym's communications business unit.

Quehl joins Gensym from Eastman Software Inc., a subsidiary of Eastman Kodak, where he served as senior vice president of Americas' field operations. Under his leadership, North American field operations software revenue increased from $2 million to $20 million in two years.

SKY LATIN AMERICA

New President

Mark Goldman was named president and CEO of Sky Latin America LLC (formerly known as Sky Entertainment Services Latin America Inc.) by the board of directors. Goldman, who had been senior vice president and general manager for Sky Entertainment Services Latin America, assumes day-to-day management responsibilities for the company.

Services

ACES

On Schedule

Pasifik Satelit Nusantara (PSN) has completed a successful tour of the operations of its Asia Cellular Satellite (ACeS) project. The operations update confirmed for attending Asian government officials, financial backers, potential service providers and ACeS partners that the ACeS satellite is on schedule for a January 1999 launch. The tour also highlighted the strong support the ACeS project is receiving from the governments of Indonesia and other nations who will benefit from the service.

BRITISH TELECOM — More Services for U.S. Inmarsat Users

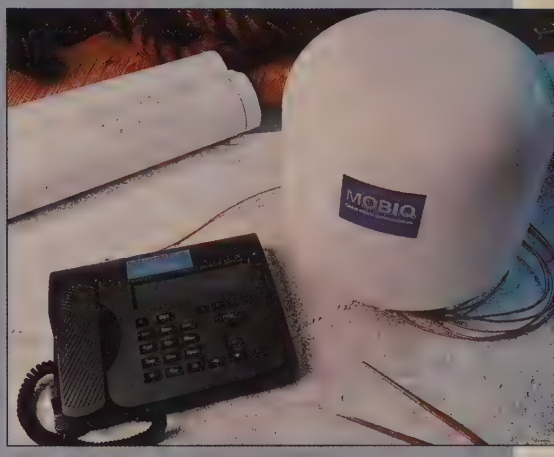

Photo courtesy of BT

British Telecommunications plc (BT) made the mobile satellite service (MSS) headlines this fall when it announced a number of initiatives for mobile and maritime communications, including an effort to expand its satellite offerings to U.S. users. "While BT's Inmarsat services have been available to U.S. customers in the past, we are making it easier and more convenient with our new dedicated customer service, sales and support staff based in New York," said Pat Ryan, regional sales manager for BT North America.

Nationwide, BT employs a staff of 300 executives to work with U.S. customers, 11 of which are dedicated to BT's Inmarsat services.

BT's U.S.-based Inmarsat customers will now have access to special pricing through a "low-cost global U.S. dollar program with price reductions up to 25 percent." Discounts are calculated on monthly usage, Ryan explained, adding that the company's one-stop shopping allows users to combine worldwide charges for all Inmarsat services and BT's land earth stations to produce even greater discounts.

For example, a three minute off-peak A-Sat phone call to the United States would be $11.28 with no additional discount. When a 25 percent usage discount is applied, the call goes down to $8.46. Customers spending as little as $100 per month will receive a discount of five percent. Savings become greater with higher call volume.

In a related announcement, BT introduced its compact mobile communications system, Mobiq, to maritime users. The maritime version of BT's satellite phone includes a small remote-mounted stabilized antenna, housed under a miniature dome. Mobiq Marine, provided jointly by BT and its longtime Norwegian partner Telenor, allows users to send and receive voice, fax and data communications, including e-mail, at 2.4 kbps. Mobiq Marine terminals cost around $7,000; airtime is billed on a per minute basis.

"A lot of Inmarsat customers hated having to use different tariffs," said Patrick Spink, manager of BT's maritime and land mobile satellite services. "They wanted an easy pricing structure. To make it easy, we charge $3 per minute wherever they are in the world. For every 100 minutes they use, we give them 10 free minutes of airtime."

The Mobiq service is also available to land-based customers. Mobiq users simply dial phone numbers in the same way they would if they were using a conventional land-line phone. Mobiq terminals operate with a removable SIM (subscriber identity module) card that offers security and allows users to share telephones while retaining their billing data and speed-dial numbers on their personal card.

But, because Inmarsat satellites are prohibited from operating within the ➤

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BRITISH TELECOM — More Services for U.S. Inmarsat Users

United States (the FCC has given AMSC the license to provide U.S. MSS services), BT's customers cannot take advantage of the land-based Mobiq product within U.S. borders. BT believes that U.S. businesspeople will use the service abroad. "It's aimed at the business traveler and companies that operate overseas, particularly in remote places," said Sally Anne Ray, Mobiq's marketing manager. "Although customers can't use it within the mainland U.S., they can use it extensively once they leave the country."

Mobiq is one of the smallest ground terminals that operate with Inmarsat's global mobile satellite system. New services from competing operators will bring MSS to users with portable handsets. To remain competitive in the future, Inmarsat is planning a new generation of satellites called Horizon, which will provide portable, higher-data rate multimedia services.

"Mobiq is the product that is taking Inmarsat services into the mass market and into all geographic and applications markets," Spink said, adding that a 64 kbps Mobiq service is under development.

COMSAT
In Flight Satellite Communications

Delta Air Lines has selected Comsat Mobile Communications to provide satellite communications services to both passengers and cockpit crews on all international flights.

Under the new three-year contract, Comsat will transmit voice and fax calls from the passenger cabins of Delta's international fleet. Delta's passenger calls are transmitted via the Inmarsat satellite system to one of four land earth stations, and then are completed through the public telephone network to anywhere in the world.

GLOBALSTAR
Beijing Gateway

Chinasat, a division of the Ministry of Post and Telecommunications (MPT) of China, has commenced construction of the first commercial Globalstar gateway in China. Chinasat has also taken a step in initiating Globalstar services across China with the dedication of a new company, the China Telecoms Mobile Satellite Telecommunications company, that will manage all Globalstar operations in China.

The gateway is located at Chinasat's satellite control and telecommunications facility on the outskirts of Beijing, and is the first of three gateways to be built in China. Subsequent gateways will be built shortly thereafter in Guangzhou and Lanzhou, where siting and survey work is underway.

JJDLC
Star Schools Grant

The Juvenile Justice Distance Learning Consortium (JJDLC) will receive a $10 million, five-year Star Schools grant from the U.S. Department of Education, to serve the educational needs of incarcerated youth.

JJDLC is composed of three charter-member state agencies: The Florida Department of Corrections, the New York Office of

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a New Bird soars in Asia's skies

Early next year AsiaSat 3 will fly alongside AsiaSat 1 and 2 over Asia, the Middle East, CIS and Australasia. This powerful new Hughes HS-601HP satellite will share AsiaSat 1's position at 105.5°E , a prime nesting site that's already watched by over 200 million people. C-band and Ku-band transponders are now available for rental with no limitations on customer type. Get on board AsiaSat 3, as you can't afford not to be seen in the hottest spot in Asia's skies. Please call, fax or e-mail us for more information, or simply visit our Website at http://www.asiasat.com.hk

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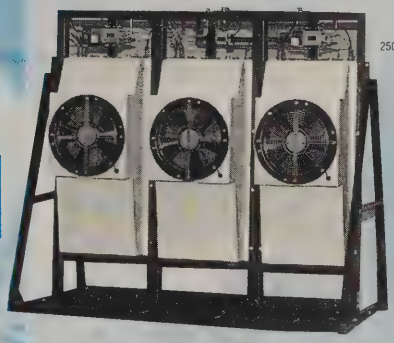

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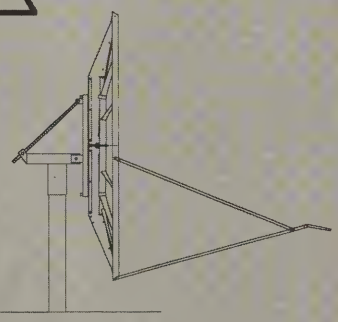

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Children and Family Services and the Texas Youth Commission. The Juvenile Justice Network will be using satellite, telephone and computer technologies to meet a variety of educational needs at juvenile justice facilities.

ORTEL
Receives Senate Award

Ortel Corp. has been awarded the U.S. Senate Committee on Small Business' 1997 Tibbetts Award in recognition of Ortel's participation in the Small Business Innovation Research program.

The award acknowledges Ortel's wide array of state-of-the-art technology made possible by the company's research and development of high-power photodiodes. Ortel's high-power photodiodes provide dramatic improvements in the gain, noise and dynamic range of optical links used extensively to remote radio frequency and microwave antennas.

RADARSAT
Begins Map of Antarctica

Initial images from the first complete radar survey of Antarctica, using the Canadian Space Agency's Radarsat mission, show better-than-expected details of its massive ice streams and crevices, as well as old, buried features of the international South Pole research station established in the late 1950s.

The Antarctic Mapping Mission was made possible by rotating the satellite 180 degrees from its normal field of view, which was completed on September 11. Full mapping will require the collection of more than 5,000 images.

The high-resolution digital image mosaic of the ice sheet and exposed portions of the continent to be taken by the Antarctic Mapping Mission will serve as a benchmark for testing the predicted effects of global warming on the interior ice sheet and its bounding ice shelves. This data set also will support the development of policies to help preserve Antarctica in its relatively pristine state, as specified in the Antarctic Treaty System.

TELENOR
Expands Uplink

Telenor U.K. has contracted with BT Broadcast Services to provide additional services on its direct uplink for U.K.-based broadcasters to the Nordic countries. The service, which went live in July, broadcasts programs via Telenor's Thor 2 satellite into the Nordic region.

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- Microwave and Telco Representative
- Land, Maritime and Aeronautical Mobile Satellite Service Provider
- Transmission Service Provider
- Hardware Manufacturer, Dealer or Distributor
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- Mobile Satellite News
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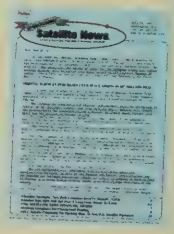
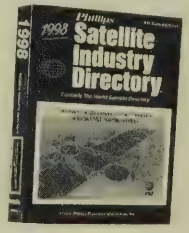


The primary goal of PBI is to serve our customers by offering information services that are of the highest editorial and program quality. The company is committed to providing you, the satellite professional, with all the information you need in a variety of delivery methods. This vital information will help you make informed decisions on business strategies and investments. In this climate of dynamic change, only one information source provides you with the essential resources necessary to propel you past your competition—Phillips Satellite Group.



Schedule of Activities (as of October 1, 1997)

Tuesday, February 17, 1998

9:00 am–5:30 pm
Satellite Basics Seminar

9:00 am–5:30 pm
Satellite Finance and Investment Summit

3:00 pm–7:00 pm
SATELLITE 98 Registration

7:00pm–11:00pm
Phillips Satellite Group Reception

Wednesday, February 18, 1998

7:00 am–5:30 pm
Registration

9:00 am–11:00 am
Opening General Session:
Global Industry Leaders Roundtable: View from the Top

11:00 am–5:00 pm
Exhibit Hall Open

11:30 am–2:00 pm
Washington Space Business Roundtable Luncheon

2:00 pm–3:30 pm
Sessions
Track A: Broadcast Beat: An Evolving Relationship (Part One)
Track B: Latin America: Rediscovering the New World
Track C: Business Television: "I Want My BTV"

3:30 pm–4:00 pm
Refreshment Break in the Exhibit Hall

4:00 pm–5:30 pm
Sessions
Track A: Satellite Manufacturing: New Paradigms of Production
Track B: DBS: The World Tunes In
Track C: VSATs: A Dish for All Seasons

6:00 pm–7:00 pm
SSPI Reception

7:00 pm–11:30 pm
SSPI Banquet

Thursday, February 19, 1998

7:00 am–6:00 pm
Registration

7:00 am–8:30 am
Exhibitor Forums

8:30 am–10:00 am
General Session:
Mobile Satellite Services: Markets on the Move

10:30 am–12:00 pm
Sessions
Track A: Asia Pacific: "Go East, Young Man"
Track B: Launch Vehicles: Aiming for the Stars
Track C: Satellite Statistics: Charting New Directions
Track D: MSS: Revenue Opportunities or Profit Threats for Wireless Carriers? (Session Sponsored by *Wireless Business & Technology* Magazine and WB&T 98)

11:00 am–5:00 pm
Exhibit Hall Open

12:15 pm–1:45 pm
SATELLITE 98 Keynote Address & Luncheon
1997 Satellite Executive of the Year Award Presentation

4:30 pm–6:00 pm
Sessions
Track A: Broadcast Beat: An Evolving Relationship (Part Two)
Track B: Regulatory Review: Cutting Through the Red Tape
Track C: Expanding Paging Networks Into the Next Millennium (Session Sponsored by *Wireless Business & Technology* Magazine and WB&T 98)

6:00 pm–7:30 pm
1997 Satellite Executive of the Year Reception

Friday, February 20, 1998

8:00 am–1:00 pm
Registration

9:00 am–10:30 am
General Session
Satellites and the Internet: Netting Big Profits

9:00 am–1:00 pm
Exhibit Hall Open

11:00 am–12:30 pm
General Session
Satellites and the Internet: Surfing the Next Wave in Satellites

General Sessions

What are today's technology and business leaders doing to advance the industry? Hear their message first-hand at SATELLITE 98.

WEDNESDAY, FEBRUARY 18, 1998

9:00 am–11:00 am
Opening General Session

GLOBAL INDUSTRY LEADERS ROUNDTABLE: VIEW FROM THE TOP

In the past, only a handful of international satellite organizations provided a completely global satellite solution. Today, domestic operators are expanding their horizons and setting their sights on the multi-national satellite market. U.S. operators in particular have begun moving beyond their domestic boundaries to achieve their goal of becoming global satellite service providers. This unique panel brings together the leaders of companies whose satellite fleets are forming worldwide space-based telecommunications infrastructures, who will answer your questions about going global in today's extremely competitive environment.

Moderators:
Cynthia Boeke, Editor/Associate Publisher, *Via Satellite*
David Bross, Associate Publisher of Editorial, *Satellite News*

Panelists:
Neil Bauer, President & CEO, Orion Network Systems, Inc.
Romain Bausch, Director General, SES Astra
James Beitchman, President, Lockheed Martin Intersputnik
John F. Connelly, Chairman and CEO, GE American Communications, Inc.
Irving Goldstein, Director General and CEO, Intelsat
Terry Hart, President, Loral Skynet
Fred Landman, President and CEO, PanAmSat

THURSDAY, FEBRUARY 19, 1998

8:30 am–10:00 am
General Session

MOBILE SATELLITE SERVICES: MARKETS ON THE MOVE

Mobile satellite services are evolving rapidly, thanks to new constellations of spacecraft designed to bring global roaming services to cellular phone consumers. A host of companies have been licensed to bring advanced voice and data services to users with handheld terminals. These companies are ushering in a new era of satellite communications using state-of-the-art spacecraft in geostationary as well as non-traditional orbits. The issues surrounding their implementation are myriad. Join the leaders of the MSS revolution as they debate the regulatory, financial, technical and marketplace questions they face now and in the years ahead.

Moderators:
Cynthia Boeke, Editor/Associate Publisher, *Via Satellite*
Cindy Stevens, Editor, *Wireless Business & Technology*

Panelists:
David Castiel, President and CEO, Ellipso/Mobile Communications Holdings, Inc.
Frank DiBello, Director, International Finance, Constellation Communications Corp.
Douglas Dwyre, President, Globalstar LP
Warren Grace, Director General, Inmarsat
Olof Lundberg, Chief Executive Officer, ICO Global Communications
Edward F. Staiano, Vice Chairman and CEO, Iridium LLC

FRIDAY, FEBRUARY 20, 1998

9:00 am–10:30 am
General Session

SATELLITES AND THE INTERNET: NETTING BIG PROFITS

Satellites are playing a profound role in providing Internet and multimedia services around the world. Virtually every satellite company has or is developing an Internet and/or multimedia-related product. Whether it be Internet delivery in developing countries or downloading of high-capacity data from the Net to a user's home PC, the applications are growing. Executives from a wide array of satellite companies will discuss how their Internet-related services are changing the way in which companies and individuals receive data from the Net.

Moderator:
Robustiano Fernandez, Associate Editor, *Via Satellite*

Panelists:
Dennis Conti, Ph. D., Vice President, North America Sales & Marketing, Hughes Network Systems
Burt Liebowitz, Vice President, Technology, Orion Network Systems
Raja Nasreldine, Director, Technical Marketing, Comstream
Abe Peled, CEO, NDS, Ltd
John Stevenson, Senior Engineering Director, Internet/Interactive Services, Intelsat
Jim Stratigos, President and CEO, Media4

11:00 am–12:30 pm
General Session

SATELLITES AND THE INTERNET: SURFING THE NEXT WAVE IN SATELLITES

Over the past several years, Ka-band satellite proposals have taken center stage in discussions about the future of the satellite industry. Last year, Ka-band system backers moved ahead in the field of licensing, at the same time beginning to garner the billions of dollars in financing needed to make their projects a reality. Leading Ka-band system executives will provide overviews of the past year's developments and future activities as they continue to achieve regulatory, financial and marketplace milestones.

Moderator:
Theresa Foley, Correspondent, Communications Week International

Panelists:
Adi Adiwoso, CEO/President Director, Pasifik Satelit Nusantara
Russell Daggatt, President, Teledesic
Ed Fitzpatrick, Vice President, Hughes Communications Inc.
Ronald Maehl, President, Cyberstar/A Loral Company
Franscesco Rispoli, General Manager EuroSkyWay, Alenia Aerospazio
Karl Savatiel, President, Astrolink
Pascale Sourisse, Chief Executive Officer, SkyBridge L.P.

Sessions

Keep pace with technological advances and regulatory changes. Find out about these topics, and more!

WEDNESDAY, FEBRUARY 18, 1998

2:00 pm–3:30 pm

Track A—BROADCAST BEAT: An Evolving Relationship (Part One)

Broadcasters and cable programmers are the biggest full-time users of satellite capacity. Right now, they are in a state of transition as new technologies like DBS and digital video compression take hold. How are they responding to these changing technical requirements? What are the major regulatory and financial issues they face when it comes to satellite broadcasting? How do they think satellite operators can better serve the video market? Come hear leading broadcasters and programmers discuss the satellite scene and how it affects their networks.

Moderator:
Katie McConnell, Managing Editor, *Via Satellite*

Panelists:
Louis Cooper, Manager, Telecommunications, CTV Television Network, Ltd.
Robert Ottenhoff, Executive Vice President & COO, PBS
Dick Tauber, Vice President, Satellites & Circuits, CNN
Richard Wolfe, Director, Telecommunications and Distribution, ABC

2:00 pm–3:30 pm

Track B—LATIN AMERICA: REDISCOVERING THE NEW WORLD

Latin America is a key market for many satellite applications. From VSATs to DBS, Latin American companies and consumers are adopting the latest satellite technology to send and receive voice, video and data signals. New satellites are being launched by new and existing players to provide the high-powered coverage Latin American satellite users need to take advantage of the latest small-dish offerings for satellite-delivered services. Our panel of renowned Latin American satellite executives will describe the promise and the challenge of doing business in this area of the world.

Moderator:
Jimmy Schaeffer, Chairman & CEO, The Carmel Group

Panelists:
Hector Alonso, Chief Operating Officer, Impsat Corp.
Enrique Cervantes Martinez, Director General, Satmex
Dolores Martos, Group Director, Latin America, Intelsat
Daniel Salzer, General Manager, NahuelSat S.A.
Norberto Alvarez Vitale, President, Telepuerto Internacional Buenos Aires

2:00 pm–3:30 pm

Track C—BUSINESS TELEVISION: "I WANT MY BTV"

The use of BTV networks to deliver corporate messages, product information and rollouts, company news, and a wide range of training has been skyrocketing. Many companies now realize that BTV gives them a strategic edge in today's fast-paced business environment, and that satellites are the ideal technology to link widely dispersed sites on a national and international level. Business television network operators and experts will provide insights on their most innovative applications, their needs for the future, the challenges facing this sector of the satellite industry, and more.

Moderator:
Sam Silverstein, Assistant Editor, *Satellite News*

Panelists:
David J. Dunnington, New Business Development Manager, Broadcast Services, The Boeing Company
Benjamin Leikach, Director, The Oracle Channel
Howard Sckolnik, The Newborn Channel
George Sechrist, Executive Producer, BEAM Television

4:00 pm–5:30 pm

Track A—SATELLITE MANUFACTURING: NEW PARADIGMS OF PRODUCTION

Satellite manufacturing has become an extremely competitive business, dominated by U.S. and French-led firms. More and more, builders of spacecraft are becoming strategic partners in satellite service ventures, and aligning themselves with operators. At the same time, satellite technology is becoming more advanced, allowing smaller, simpler earth stations on the ground. Key executives from the world's leading satellite manufacturing companies will discuss marketplace and technical issues trends affecting this side of the business.

Moderator:
Scott Chase, Publisher, *Via Satellite*

Panelists:
Robert Berry, President, Space Systems/Loral
Claude Burgio, President, Lockheed Martin Telecommunications
Armand Carlier, Chairman and CEO, Matra Marconi Space
Don Cromer, President, Hughes Space & Communications
Jean-Claude Husson, President and CEO, Alcatel Espace
John Pientka, Vice President & General Manager, Advanced System Division, Motorola Space & Systems Technology Group

4:00 pm–5:30 pm

Track B—DBS: THE WORLD TUNES IN

The use of high-power satellites to deliver multi-channel programming to consumers with small dishes is proliferating not just in the United States, but around the world. Each region has its own market trends, barriers and potential, but one thing is clear: DBS is an international phenomenon. The number of DBS satellites under construction is growing at a record-breaking pace, and the race to reach the masses is well underway. Top DBS executives will provide their insights on the promise and the pitfalls of the global DBS market.

Moderator:
David Bross, Associate Publisher, *Satellite News*

Panelists:
Yves Elsen, Director of Marketing, SES Astra
Eui Koh, Managing Director, Asia-Pacific, Intelsat
David Moskowitz, Senior Vice President & General Counsel, EchoStar Communications
Dan O'Brien, President & COO, Primestar Partners
Noah Samara, Chairman & CEO, Worldspace, Inc.

4:00 pm–5:30 pm

Track C–VSATs: A DISH FOR ALL SEASONS

The market for VSATs continues to grow steadily in most areas of the world. VSAT applications, however, are becoming more advanced as digital satellite solutions become available. VSAT network operators and experts will highlight how VSAT networks are used for a host of voice and data requirements, from flood management to inventory control, from corporate Intranet to rural telephony. VSAT activities in different regions of the world will be outlined, along with the need for VSAT users and companies to work together to bring down regulatory barriers and make their needs better understood by satellite operators.

Moderator:
Robustiano Fernandez, Associate Editor, *Via Satellite*

Panelists:
Steven Bendawall, Assistant Vice President, Enterprise Rent-A-Car,
Chuck Emmert, President, Telcom Applications
Klemens Gutmann, Vice President of Technology, Teleport Sachsen-Anhalt
Nick Putz, Director, Satellite Services, Rite Aid Corporation
Ralph Tozier, Managing Director, PT Citra Sari Makmur

THURSDAY, FEBRUARY 19, 1998

10:30 am–12:00 pm

Track A–ASIA-PACIFIC: "GO EAST, YOUNG MAN"

The Asia-Pacific, with its vast terrain and widespread population centers, continues to be a hotbed of activity in today's burgeoning market for satellite communications. More satellites are being launched in this region than any other. The number of Asian operators is growing, as are the types of services available. Satellite operators and service providers focusing on Asia will discuss how growth and change in this vibrant satellite market are helping, and sometimes hindering, the expansion of their offerings.

Moderator:
Sam Silverstein, Assistant Editor, *Satellite News*

Panelists:
Jeffrey Blatt, Director, Business Affairs & General Counsel, ASTRO
Seon J. Chung, Ph.D., Vice President, Satellite Communications Division, Electronics and Telecommunications Research Institute
Gregg Daffner, GMPCS Consultant, Hongkong Telecom
Tong Mun Loo, GM (ST-1 Marketing), Satellite Business Development, Singapore Telecom
Yasuo Otaki, Executive Vice President, Space Communications Corp.

10:30 am–12:00 pm

Track B–LAUNCH VEHICLES: AIMING FOR THE STARS

The launch vehicle landscape is changing, as more players enter the growing market to boost satellites into orbit. At the same time, the demands placed on launch vehicles are increasing. Customers need to launch heavier spacecraft or clusters of small satellites faster, cheaper and more reliably. Launch vehicle operators are working intensively to meet these new requirements. High-level executives from rocket companies will outline their efforts, as the number of launches continues at a breathtaking pace.

Moderator:
Tom Breen, Editor, *Space Business News*

Panelists:
Dan Brandenstein, Executive Vice President and Program Manager, Kistler Aerospace Corp.
Robert Cowls, General Manager, Commercial Delta, The Boeing Company
Tateo Hosomura, Executive Vice President, Rocket Systems Corp.
Charles Lloyd, President, International Launch Services
Jean-Marie Luton, President and CEO, Arianespace

10:30 am–12:00 pm

Track C–SATELLITE STATISTICS: CHARTING NEW DIRECTIONS

Have you ever tried to make sense of the numbers behind the satellite industry's growth? Making the task more daunting is the fact that each sector requires its own data, trends and analysis. Leading industry experts will provide the answers to many of your questions regarding the size and scope of the satellite industry, both today and into the future.

Moderator:
Robustiano Fernandez, Associate Editor, *Via Satellite*

Panelists:
Simon Bull, Senior Consultant, Comsys
Stephane Chenard, Senior Consultant, Space & Communications, Euroconsult
Evie Haskell, Managing Director, SkyTrends
Susan Irwin, President, Irwin Communications
Roger Rusch, President, TelAstra, Inc.
Leslie Taylor, President, LTA Associates

10:30am–12:00pm

Track D–MSS: REVENUE OPPORTUNITIES OR PROFIT THREAT FOR WIRELESS CARRIERS?

(Session Sponsored by *Wireless Business & Technology magazine* and WB&T 98)

With multiple MSS networks on the horizon, what will be the impact to wireless carriers' business plans in the next five years? Will these new systems be complementary providing carriers with extended range and coverage or will they be a competitive threat costing carriers money and customers? This panel will discuss the opportunities ahead and look at the MSS issue from the wireless carrier's perspective.

Panelists:
Sam Ginn, President, AirTouch
John Stupka, President & CEO, SkyTel
David Thompson, CEO, Orbital Sciences

4:30 pm–6:00 pm

Track A–BROADCAST BEAT: AN EVOLVING RELATIONSHIP (Part Two)

Broadcasters are the most profitable group of satellite users for satellite operators, and their requirements are growing. Broadcasters rely on satellites to distribute programming to TV stations, cable headends and directly to the consumer. Digital satellite services, cheaper prices and better availability top their list of needs. For their part, satellite operators are working to provide more advanced services and create a closer partnership with their biggest customers. Come hear well-known broadcasters discuss how their relationship with satellite companies can become stronger.

Moderator:
Katie McConnell, Managing Editor, *Via Satellite*

Panelists:
Jack Freidman, Vice President, Technology Business Affairs, Viacom
Alastair Hamilton, Vice President, Satellite Systems, TBS
Leslie Nittler, Vice President, New Media, Encore Media Corp.
Peter Senger, Chief Engineer, Deutsche Welle
Robert Zitter, Senior Vice President, Technology Operations, HBO

4:30 pm–6:00 pm

Track B: REGULATORY REVIEW: CUTTING THROUGH THE RED TAPE

As satellites become more important in a telecommunications-intensive environment, the related regulatory problems are expanding exponentially. From the restructuring of Intelsat to the growing number of lawsuits, from the feeding frenzy for spectrum allocations to the opening up of domestic satellite markets, the regulatory aspect of the satellite industry is prevalent in virtually every move a satellite company makes. Regulatory experts will discuss these important issues and how they are changing the way in which satellite business is conducted.

Moderator:
Delbert Smith, Partner, Reed, Smith, Shaw & McClay

Panelists:
Jorn Christensen, Frequency Coordination Expert, J. Christensen Consultants, Ltd.
Regina Keeney, Bureau Chief, FCC International Bureau
Steven Lett, Deputy US Coordinator—International Communications and Information Policy, State Department
Lon Levin, Co-Chairman, Satellite Industry Association
Gerry Oberst, Partner, Hogan & Hartson, LLP

4:30pm–6:00pm

Track C—EXPANDING PAGING NETWORKS INTO THE NEXT MILLENNIUM

(Session Sponsored by *Wireless Business & Technology magazine* and WB&T 98)

Mobile satellite services currently enable paging carriers to extend local service areas providing subscribers with additional coverage. As part of a competitive paging strategy, MSS will play an important role as carriers plan for long-term network growth and expansion. However, satellite paging is not just for large operators anymore. For many smaller paging companies that have more than ten sites, using MSS can be less expensive than terrestrial connections as the cost-per-site decreases as a network grows. In addition, narrowband PCS operators will be able to realize these economies of scale as well and with more proposed MSS data only systems on the horizon, system monitoring and data collection will be even more widely used in the future.

Panelists:
Al Stem, President & CEO, SpaceCom
Alan Parker, President, Orbcomm
Tom Velez, President, CTA/GEMNET
Nader Modanlo, President, The Final Analysis
Fred Thomas, Vice President, E-Sat, Inc.

NOTE: Speakers are invited and are subject to change.

SATELLITE 98 Exhibition—Face to Face with Technology

Meet suppliers on the cutting edge of the satellite industry and get first hand answers on available products and services. Comparison shop, see new product demonstrations, pick up expert answers and literature, or even place orders right on the exhibit floor.

Take your questions directly to leading suppliers. Following is a list of current SATELLITE 98 exhibitors (as of October 15, 1997):

ACT Networks, Inc.
Advantech
Advent Communications Ltd.
AIL Systems, Inc.
All Mobile Video
Allied Signal Technical Services
Anacom, Inc.
Analytical Graphics, Inc.
Andrew Corporation
Avcom of Virginia, Inc.
Avtec Systems, Inc.
Baird Satellite Supporting Systems
Boeing Commercial Space Company
C-Grams Unlimited, Inc.
California Microwave EFData
Channel Master
Columbia Communications Corporation
COMLINK, Inc.
COMSAT RSI
Comstream Corporation
Comtech
CPI Traveling Wave Tube Products
CPI Satcom Division
CRI
Crown International
DataViews Corporation
Design Publishers
DNE Technologies, Inc.
EEV, Inc.
Electromagnetic Sciences
Engineering and Technical Services (ETS)
Fisher Communications, Inc.
Gamma-f Corporation
Globecomm Systems, Inc.
Harris Corporation
Hewlett Packard
IDB Systems
Integral Systems, Inc.
INTELSAT
International Datacasting Corporation
Interstate Electronics Corporation
Kaman Sciences Corporation
KenCast, Inc.
KVH Industries, Inc.
L3 Communications Telemetry and Instrumentation
LandSea Systems, Inc.
Launchspace Magazine
Litton Electron Devices
LNR Communications, Inc.
Lockheed Martin Microwave/Narda West
Lockheed Martin Telecommunications
MAXTECH, Inc.
McDonnell Douglas
MCL, Inc.
MITEQ, Inc.
National Digital Television Center
New England Satellite Systems, Inc.
Next Level Systems
NORTEL (Northern Telecom)
Nuera Communications, Inc.
Orbit CT&T, Inc.
Orbital Sciences Corporation
Orion Network Systems
Ortel Corporation
Paradise Datacom
Pascall Electronics Ltd.
Photocomm, Inc.
Power Technologies, Inc.
Prodelin Corporation
Quintech Electronics and Communication
Radyne Corporation
Robinson Satellite Communications
RSSC
SierraCom
Society of Satellite Professionals International
Space News
SpaceTec
Spectrum Astro
SSE Telecom
Standard Communications Corporation
Stanford Telecom
Storm Control Systems, Inc.
Tampa Microwave Lab, Inc.
Tandberg Television
Terrasat, Inc.
Thomson Components & Tubes Corp.
TLI Satellite Services
TSI TelSys
VertiCom, Inc.
Vyvx
W.B. Walton Enterprises, Inc.
Washington International Teleport
WavePhore Networks, Inc.
Wegener Communications, Inc.
Xicom Technology

Would you like exhibit information?
Call Lori Kravchick at (301) 340-7788, ext. 2940 for an Exhibitor Prospectus or fax (301) 340-7136.

PRE-CONFERENCE PROGRAMS

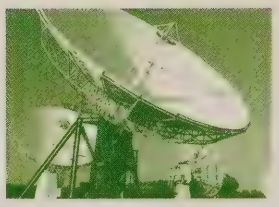
Pre-Conference Program 1: Satellite Basics

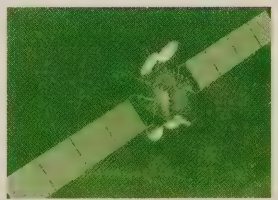
An industry-renowned seminar offered in a convenient one-day format. Via Satellite magazine presents the most comprehensive seminar offering a study of the technology and issues surrounding satellites. The seminar is geared for professionals at all experience levels. Find out how satellites fit into the total telecommunications industry; who is doing what in satellite communications; major issues and trends in satellite communications; and what the confusing terms, jargon, buzz words and acronyms used in satellite business mean. Your seminar leader, Dr. Mark Chartrand, brings over ten years of experience conducting telecommunications training programs and conferences to you.

Satellite Basics Schedule

8:00 am–9:00 am	Registration
9:00 am–10:30 am	Satellite Business: Applications, Markets and Regulation
10:30 am–10:45 am	Break
10:45 am–12:30 pm	Technical Background: The Alphabet Soup Clarified
12:30 pm–1:30 pm	Luncheon
1:30 pm–3:30 pm	The Space Segment: What's Up and How It Is Used
3:30 pm–3:45 pm	Break
3:45 pm–5:00 pm	The Ground Segment: Down-to-Earth Operations and How It Works
7:00 pm–10:00 pm	Phillips Satellite Group Hospitality Suite

COMMUNICATIONS FUNDAMENTALS
SATELLITE CONSTRUCTION
SATELLITE OPERATIONS
EARTH STATIONS
ANTENNA POINTING
ANTENNA PARAMETERS
LINK PERFORMANCE
SIGNAL PROCESSING
SATELLITE SERVICES AND NETWORKS
SATELLITE SYSTEMS
REGULATORY AND POLICY ISSUES
MARKETING AND BUSINESS ISSUES





Make the most out of your trip to SATELLITE 98! To maximize your schedule of education and networking, we have designed one-day seminars on the day prior to SATELLITE 98—Tuesday, February 17, 1998. As a SATELLITE 98 participant, you will enjoy significant savings if you also register for one of these two programs. See registration information for details.

Pre-Conference Program 2:

SATELLITE Finance and Investment Summit

Via Satellite's second annual Satellite Finance and Investment Summit will create a unique forum for conducting business. Topics of discussion will include public debt and equity offerings; private placements; project financing; strategic partners and more. Leading investors and financial analysts will talk about the pros and cons of different financing strategies and highlight the advantages and disadvantages of doing business in the high-stakes satellite environment. Satellite company financial executives will outline the ways in which they are bringing together billions of dollars to make their projects a reality. Come network with leading satellite industry executives and international investors, while discussing the financial nuts and bolts of the satellite industry at *Via Satellite*'s 1998 Satellite Finance and Investment Summit.

Satellite Finance and Investment Summit Schedule

(as of October 15, 1997)

8:45 am–9:00 am

Opening Remarks

Cynthia Boeke, Editor/Associate Publisher, Via Satellite

9:00 am–9:30 am

State of the Satellite Industry

Stephane Chenard, Analyst, Euroconsult

Euroconsult has been watching, analyzing and quantifying the satellite industry for many years. Join industry expert Stephane Chenard for this comprehensive overview on how big the satellite industry is, how much it is growing, and where it is headed.

9:30 am–11:00 am

PANEL 1: INVESTING IN SATELLITES (Part One)

There are many opportunities to invest in satellite companies. Leading satellite analysts and investors will discuss which satellite companies, stocks and markets are the most promising areas of investment, and why they believe this industry has the potential for profit and/or loss.

Moderator:
Theresa Foley, Correspondent,
Communications Week International

Panelists:
Thomas Watts, Vice President, Global Securities Research & Economics, Merrill Lynch

Daniel Flatley, Managing Director, Investment Banking, Donaldson, Lufkin & Jenrette

Andrew Wallach, General Partner,
Cumberland Associates

Wolfgang Demish, Managing Director, BT Securities

Richard Smithies, Director, Space Industry Group,
Barclays Bank

Mathis Shinnick, Managing Director,
The Chase Manhattan Corp.

11:00 am–11:15 am

Refreshment Break

11:15 am–12:30 pm

PANEL 2: SATELLITE FINANCING: THE VIEW FROM THE INDUSTRY

Satellite companies use a variety of funding mechanisms to build their systems. CFOs from a variety of satellite companies will discuss how they have seen satellite financing change, and how they are tapping into the global banking community to get their projects off the ground.

Moderator:
Sam Silverstein, Assistant Editor, Satellite News

Panelists:
John J. Nokleberg, Chief Financial Officer, Teledesic

Ramin Khadem, Chief Financial Officer, Inmarsat

David Frear, Senior VP & CFO, Orion Network Systems

Larry Boisvert, President/CEO, Telesat Canada

Michael Whiddett, Chief Financial Officer, ICO Global Communications

Thanin Angsuwarangsi, CFO, PT. Asia Cellular Satellite

12:30 pm –2:15 pm

Luncheon

2:15 pm–3:45 pm

PANEL 3: INVESTING IN SATELLITES (Part Two)

The satellite industry is a hot commodity right now for global investors. Our second panel of leading satellite analysts and financiers will comment on which projects they like to back and why, as well as the current and future investment climate for the satellite business.

Moderator:
Marc Crossman, Satellite Analyst,
Oppenheimer & Co. Inc.

Panelists:
Robert Gordon, Managing Director, Bank of America

J. Tracy Mehr, Director, Deutsche Morgan Grenfell

John Higginbottom, General Partner & President,
Spacevest

Brigitte Vienne, Director General,
Arianespace Finance, Arianespace

Gilles Gantois, Vice President, Telecom and Space Group,
Credit Lyonnais

3:45 pm–4:00 pm

Refreshment Break

4:00 pm–5:30 pm

PANEL 4: INSURANCE, UNDERWRITING AND RISK MANAGEMENT

No one wants to see new spacecraft launched successfully more than the insurance community. This panel of insurers, underwriters and risk managers will discuss how recent trends are affecting insurance rates, how the world's underwriters view the satellite market, and ways in which satellite companies can manage an inherently risky business.

Moderator:
Delbert D. Smith, Partner, Reed, Smith, Shaw & McClay

Panelists:
Glen Surles, President, The Aurora Group

Christopher Kunstadter, Senior Vice President,
US Aviation Underwriters

Mark Quinn, Senior Vice President,
Willis Corroon Inspace

Jean-Michel Eid, Vice President,
International Space Brokers

William J. Mahoney, Partner, Milbank,
Tweed, Hadley & McCloy

Peter D. Nesgos, Partner,
Winthrop, Stimson, Putnam & Roberts

7:00 pm–10:00 pm
Phillips Satellite Group Hospitality Suite

Special Events

SATELLITE 98 participants are invited to enjoy these special occasions scheduled during the conference.

Wednesday, February 18, 1998

11:30am–2:00pm

Washington Space Business Roundtable Luncheon

The Washington Space Business Roundtable (WSBR) will host a reception followed by a luncheon featuring a prominent industry speaker. This event is an ideal opportunity to meet industry leaders and discuss issues of importance for both the short and long term growth of the industry. The cost of the event is $45 ($35 for WSBR members). Contact WSBR at (+1-202-973-8697) or by fax at +1-202-331-0111.

6:00pm–11:30pm

The Society of Satellite Professionals International Industry Innovator Awards Reception and Gala

The Society of Satellite Professionals International (SSPI), a professional non-profit organization, is devoted to upgrading the knowledge and capabilities of professionals employed by or interested in the field of communications via satellite. SSPI's purpose is to strengthen the industry today and encourage and provide education for those who will enter and manage for change and growth the satellite industry of the future.

Since its inception, growth and change have defined the satellite industry and every year the SSPI honors those who best meet that challenge with its competitive Industry Innovator Award. Join SSPI in an evening celebration starting with a champagne reception followed by dinner, and the scholarship and industry awards. Last year the gala was attended by over 850 distinguished industry executives and again this year it promises to be professionally rewarding as well as very fun and entertaining.

The cost for this memorable evening is $95 and you can reserve your seat when you register for SATELLITE 98. For more information or for information on sponsoring a corporate table, contact SSPI at +1-703-243-8948 or by fax +1-703-528-4084.

Thursday, February 19, 1998

12:15pm–1:45pm

SATELLITE 98 Keynote Luncheon

1997 Satellite Executive of the Year Presentation

6:00pm–7:30pm

1997 Satellite Executive of the Year Reception

An exclusive presentation from a leading industry executive will precede the exciting announcement of *Via Satellite*'s 1997 Satellite Executive of the Year. This award, presented to the executive who made the most significant and lasting impact on the industry in 1997, has honored such renowned individuals such as PanAmSat's Rene Anselmo (1988); COMSAT RSI's Richard Thomas (1991); Intelsat's Irving Goldstein (1992); Ariane's Charles Bigot (1993); Hughes' Steve Dorfman (1995); and Loral Space & Communication's Bernard Schwartz (1996). Be on hand to applaud the award recipient at this luncheon and then at a reception in their honor. Tickets to these events are included with your SATELLITE 98 registration fee.

REGISTER TODAY AND SAVE WITH EARLY BIRD DISCOUNTS!

4 Ways to Register for SATELLITE 98

1. **Call: 800-777-5006 or +1-301-424-3338**
2. **Fax: +1-301-340-7136**
3. **Mail: SATELLITE 98**
   Susan Stuelpner
   1201 Seven Locks Road
   Potomac, MD 20854
4. **In Person: After February 13, 1998, do not mail or fax this form; simply present at the SATELLITE 98 Registration Area at the Sheraton Washington Hotel.**

Registration Information

FEES AND DISCOUNTS:

SATELLITE 98 Full Registration Fee: The cost for full registration is $945 and includes access to all February 18-20, 1998 SATELLITE 98 general sessions, program sessions, exhibition, 1997 Satellite Executive of the Year Luncheon and Reception, and the proceedings (to be delivered by April 1, 1998). See below for details about SEPARATE registration fees for the February 17, 1998 Pre-Conference Programs.

SATELLITE 98 Early Enrollment Registration Fee: Save $50 when you reserve your place at SATELLITE 98 on or before December 15, 1997.

SATELLITE 98 Team Discounts: We know the value of teamwork. When two or more people from the same organization register and pay together, each receives a $100 discount off the SATELLITE 98 registration fee.

SATELLITE 98 SSPI Member Discount and Membership Option: Society of Satellite Professionals International (SSPI) members receive a special registration discount of $50 (this discount only applies to individual membership rates). You can also join or renew your membership at the time you register for SATELLITE 98. The annual membership fee is $60. For more information on SSPI, phone +1-703-243-8948.

Pre-Conference Program Registration Fees: The fee for either seminar, Satellite Basics or Satellite Finance and Investment Summit, is $635 and includes seminar proceedings, lunch, breaks and exhibition access. No discounts are permitted with seminar registration fees.

SPECIAL Pre-Conference Program/SATELLITE 98 Registration Fee: A special rate of $1,325 (a $205 savings!) is available when you attend one of the Pre-Conference Programs along with SATELLITE 98. This special rate cannot be combined with any other discounts.

PRE-REGISTRATION DEADLINE

To ensure confirmation prior to the conference, pre-registrations must be received by February 13, 1998. After that date, it is suggested you register on-site to avoid complications.

BILLING

Individuals checking the "bill me" option will be billed only once. Payment must be received by February 13, 1998.

SUBSTITUTIONS

Substitutions may be made at any time for confirmed registrants. Notice of substitution must be made in writing and sent to the same registration address/fax number.

CANCELLATIONS

Cancellations must be received by February 13, 1998. After that date, a $350 cancellation fee will be charged. Cancellations must be made in writing and sent to the same registration address/fax number. Registrants who do not attend and who do not cancel before February 13, 1998, will be liable for their confirmed registration fee.

Hotel Information

The Sheraton Washington, renowned as the largest hotel in the city, is the premier choice for business executives. Located on 16 beautifully landscaped acres in one of the city's most exclusive neighborhoods, the Sheraton Washington is steps away from the National Zoo and the Washington Cathedral, and is within close proximity to downtown Washington, DC, with its museums, attractions and business centers. The hotel is located on the famous Washington Metro line (Woodley Park station) and is 20 miles from Washington National Airport and 45 miles from Dulles International Airport.

Special SATELLITE 98 rates are available:

Single.....$151 (standard)
Double.....$172 (standard)
(all rates are subject to city sales tax—currently 13%—and $1.50 per room per night occupancy tax—subject to change without notice).

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MCL — Expands Facility

MCL Inc., a leading manufacturer of high power amplifiers and solid state amplifiers, is expanding its facilities to accommodate the growing demand for its products. Company executives CEO Frank Morgan and COO Robert Morgan, as well as Bolingbrook Mayor Roger Claar, officially broke ground at MCL's headquarters on Friday, September 28, 1997, in Bolingbrook, IL.

The 56,000 square foot expansion doubles the company's manufacturing and warehouse space as well as increases the size of the engineering and administrative departments. The expansion comes on the heels of a major renovation of the sales and marketing departments, which was completed in mid-August.

"The whole building expansion plan is to support the marketplace," Ronald B. Adamson, executive director of sales and marketing, said at the ceremony. "We feel by expanding now we will be positioned to meet the amplifier needs of the industry for years to come."

When the expansion is completed, Adamson says that much of the manufacturing that is currently outsourced will be brought into the company, allowing MCL Inc. to more closely monitor production.

Photo courtesy of Omnia Marketing.

(L to R) MCL executives Ron Adamson, John Harrington, Bob Morgan, Frank Morgan, Mike Pfeiffer and Dennis Hammer gear up to break ground for MCL's major expansion.

The need for this additional space is due, in part, to the success of the Maxxim Series of satellite uplink amplifiers manufactured by MCL at the Bolingbrook facility. These amplifiers are a critical component of the ever expanding satellite communications industry—without it, the signal would never make it to the satellite.

MCL's customers include France Telecom, Panamsat, MCI, Andrew Corp. and Televisa Mexico. In addition to expanding its manufacturing facilities, MCL has support offices located throughout the world.

MCL's expansion is scheduled to be completed by July 1998.—*Katie McConnell, Managing Editor*

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NDS — Opens New Facility

NDS has opened a new 28,000 square foot operations facility in Lake Forest, CA. This facility is intended to work in conjunction with NDS Americas' headquarters in Newport Beach, CA, to support the company's rapidly growing customer base throughout the United States, Canada and Latin America.

Photo courtesy of NDS.

(L to R) NDS executives Dr. Abe Peled, Roy Lovell and Dr. Greg Clark cut the ceremonial ribbon to NDS' new 28,000 square foot facility.

The upgrade will increase the available number of digital television services from five to 16 to meet the demand for channels contracted by Telenor Satellite Services and Canal Digital. By avoiding the need to provide a contribution circuit, Telenor is able to offer its U.K. customers substantial savings in transmission costs to the Nordic region.

Contracts

CREOTEL

New Venture

Eckart Schober, founding vice president and former CEO of the Argentine domestic and regional satellite operating company Nahuelsat S.A., has created a new venture, Creotel S.A. Creotel offers services in market survey and analysis, strategic planning, risk management, financial engineering, marketing and sales support as well as training and presentations.

Backed by the significant experience of Schober, Creotel boasts access to a network of international experts and consultants in telecommunications, media and satellites. The company currently has support points in North and South America, Europe and Australia.

ECHOSTAR

$200 Million Stock Offering

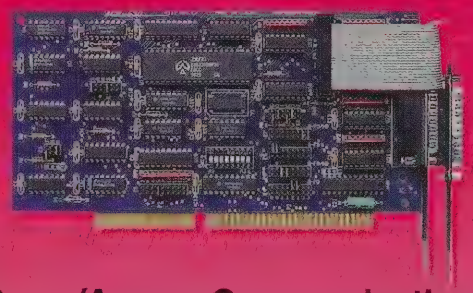
Echostar Communications Corp. plans to raise $200 million in an offering of 12-1/8 percent Senior Redeemable Exchangeable Series B Preferred Stock. Dividends on the preferred stock are payable either in cash or in additional shares of preferred stock. The preferred stock is exchangeable into debt at any time after issuance and is mandatorily redeemable by Echostar in 2004.

The proceeds from the offering will be used to expand the subscriber base for Echostar's Dish Network direct broadcast satellite system, marketing expenses and general corporate purposes.

LNR

Supplies Safari in Brazil

LNR has been awarded a contract to supply a C-band version of its Safari digital video flyaway to Rede Amazonica, a major broadcaster in Brazil. Equipped with LNR's 2.4-meter flyaway antenna, Unifold pedestal and compact digital video exciter, the Safari will be used to transmit high quality video from remote regions of the Amazon jungle area back to the studio.



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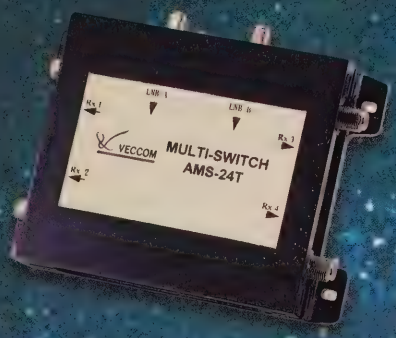

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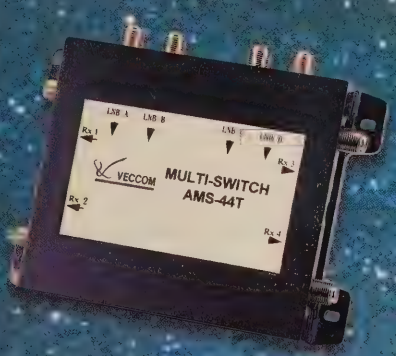

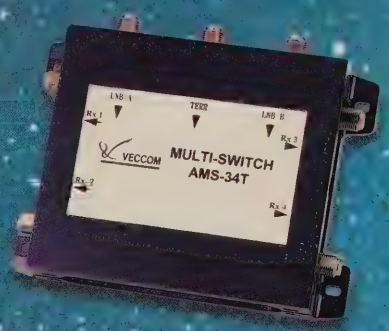

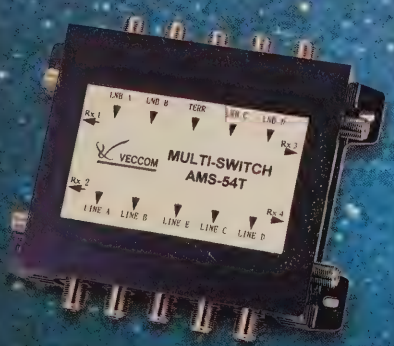

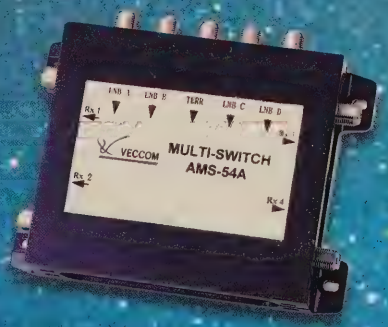

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L-3 COMMUNICATION — Tests Space Station

Photo courtesy of L-3 Communications.

Subsystem integrators of the International Space Station will soon be using two System 500 Model 550-based test and integration systems provided by L-3 Communications Telemetry & Instrumentation. The test systems are part of a $1.9 million dollar contract with The Boeing Co. in Huntsville, AL, which is expected to carry substantial follow-on as development of the International Space Station continues.

The two test systems will each consist of three commercial-off-the-shelf Model 550 chassis, which will be used to simultaneously monitor, correlate and record up to 44 MIL-STD-1553 buses in real time. This powerful 1553 bus processing capability is vital to establish baselines for validation and integration of the International Space Station's numerous and complex subsystems.

The first use of the flyaway was at a major folk festival in Parintins about 700 miles up the Amazon River. This was the first live coverage of the complete festival by Rede Amazonica. The Safari successfully transmitted four days and nights providing live coverage throughout Brazil.

MATRA MARCONI SPACE
Awarded Intelsat Contract

Matra Marconi Space has been selected to supply Intelsat's new satellite flight dynamics and commanding system. Scheduled to become operational in 1999, the system will provide a significant improvement in reliability and efficiency of operation to Intelsat's current and future fleet of satellites.

The system will be installed in its Washington headquarters, its back-up facility and the six TTC&M stations worldwide.

NEXTLEVEL
Installs MPEG 2/DVB in Thailand

Nextlevel Systems Inc.'s Satellite Data Networks Group has launched its first private business network installation of Nextlevel MPEG 2/DVB technology. The

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installation is in Thailand for Thai Farmers Bank in Bangkok.

The bank will use the new system to uplink multimedia applications from its headquarters in Bangkok to downlinks at more than 500 bank sites throughout Thailand. The sale to Thai Farmers Bank includes provisions for supplying more than 500 Nextlevel SR-3200 integrated receiver decoders (IRDs) for the bank's downlink sites.

SCIENTIFIC-ATLANTA

USA Waste Chooses Skyrelay

As USA Waste Services fuels its growth through mergers and acquisitions of other companies, it will rely on a Skyrelay Series 3000 satellite data VSAT network from Scientific-Atlanta to blend dissimilar platforms into one common network. Shared Data Networks of Charlotte, NC, will install the Skyrelay system as well as provide the shared hub services to link more than 100 new locations at United Waste Systems which merged earlier this year with USA Waste Services.

In addition to using the network for standardizing accounting, billing and other financial applications, USA Waste Services can use Skyrelay capabilities for e-mail, Internet access, Intranet connectivity, and make databases available to any workstation on the network regardless of what the core applications are.

CPI — New Ka-band Klystron

Communications & Power Industries Canada Inc. recently introduced its new broadband Ka-band klystron series for use in ground-based communications in the 20 GHz to 33 GHz frequency range. Specifically, the VKA2400S02 delivers a CW output power of 600 W over the entire frequency range of 30.05 GHz to 30.45 GHz with full instantaneous bandwidth (-1dB) of 400 MHz. Field tuning is eliminated. The VKA2400 series uses extended interaction technology to provide high RF output powers and instantaneous bandwidths in a compact standard air-cooled package. The comparatively small size and light weight of the VKA2400 series is optimal for both mobile and fixed applications. (*CPI, 45 River Dr., Georgetown, Ontario, Tel: 905/877-0161*)

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Photo courtesy of CPI Canada.

TECHNOLOGY

HUGHES

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GLOBECOMM— Satphone for Sale

Globecomm Systems Inc. is offering for sale the Globecomm Systems Explorer Portable Satphone, a small, lightweight portable satellite telephone system with ISDN service capability. This product will be marketed by the company's newly formed mobile products division. The Globecomm Systems Explorer Portable Satphone is a second generation Inmarsat B land mobile high-speed data and voice terminal. The product weighs under 30 pounds and the entire unit packs in a compact carry-bag. *(Globecomm Systems Inc., 45 Oser Ave., Hauppauge, NY 11788-3816, Tel: 516/231-9800.)*

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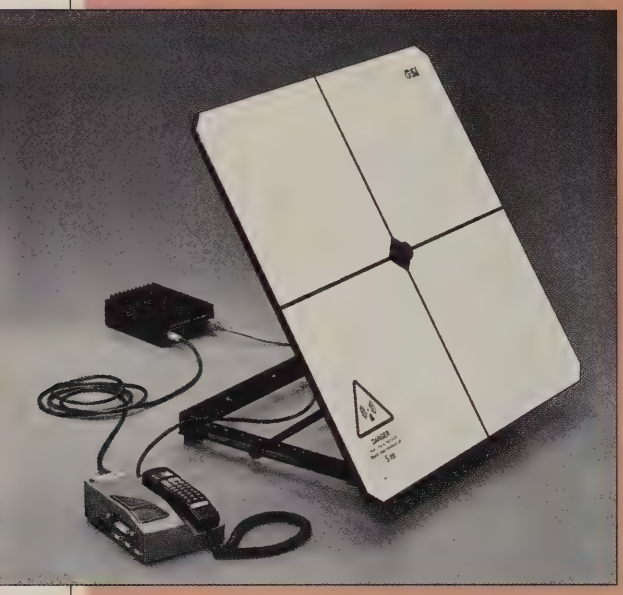

requirements are attainable as a result of a state-of-the-art xenon ion propulsion system known as XIPS. This system premiered for the first time on a commercial communications satellite with the launch of PAS 5, an HS 601HP built for Panamsat Corp., on August 27, 1997.

Ions ejected by XIPS travel in an invisible stream at a speed of 62,900 miles per hour, an increase in specific impulse which is more than 10 times that of its chemical counterpart. *(Hughes Space and Communications Co., PO Box 92919 (S10/S323), Los Angeles, CA 90009, Tel: 310/364-6363)*

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O'GARA
Releases Carfone

O'Gara recently released its news satellite telephone product, the Carfone. Carfone allows users to telephone, fax or e-mail calls anywhere on the planet. It is a fixed satellite telephone and calls are made independently of any country's host telephone system.

Specially designed for use in vehicles, it uses the latest Inmarsat mini-M spotbeam technology. Thus it is optimized to use much less power than traditional satellite phones, resulting in a smaller unit and antenna as well as lower costs both for the phone and the airtime. *(O'Gara Satellite Networks, 1 Brandywine Dr., Deer Park, NY 11729, Tel: 516/586-5100)*

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b. Paid and/or Requested Circulation (1) Sales Through Dealers and Carriers, Street Vendors, and Counter Sales *(Not mailed)*		
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e Free Distribution Outside the Mail *(Carriers or other means)*	992	1,600
f Total Free Distribution *(Sum of 15d and 15e)*	3,114	3,690
g Total Distribution *(Sum of 15c and 15f)*	24,028	27,106
h Copies not Distributed (1) Office Use, Leftovers, Spoiled	900	900
h Copies not Distributed (2) Returns from News Agents		
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16 Publication of Statement of Ownership
☒ Publication required. Will be printed in the Nov. 1997 issue of this publication
☐ Publication not required

17 Signature and Title of Editor, Publisher, Business Manager, or Owner: Scott Chase — Date: 9/12/97

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3. Be sure to furnish all circulation information called for in item 15. Free circulation must be shown in items 15d, e, and f.
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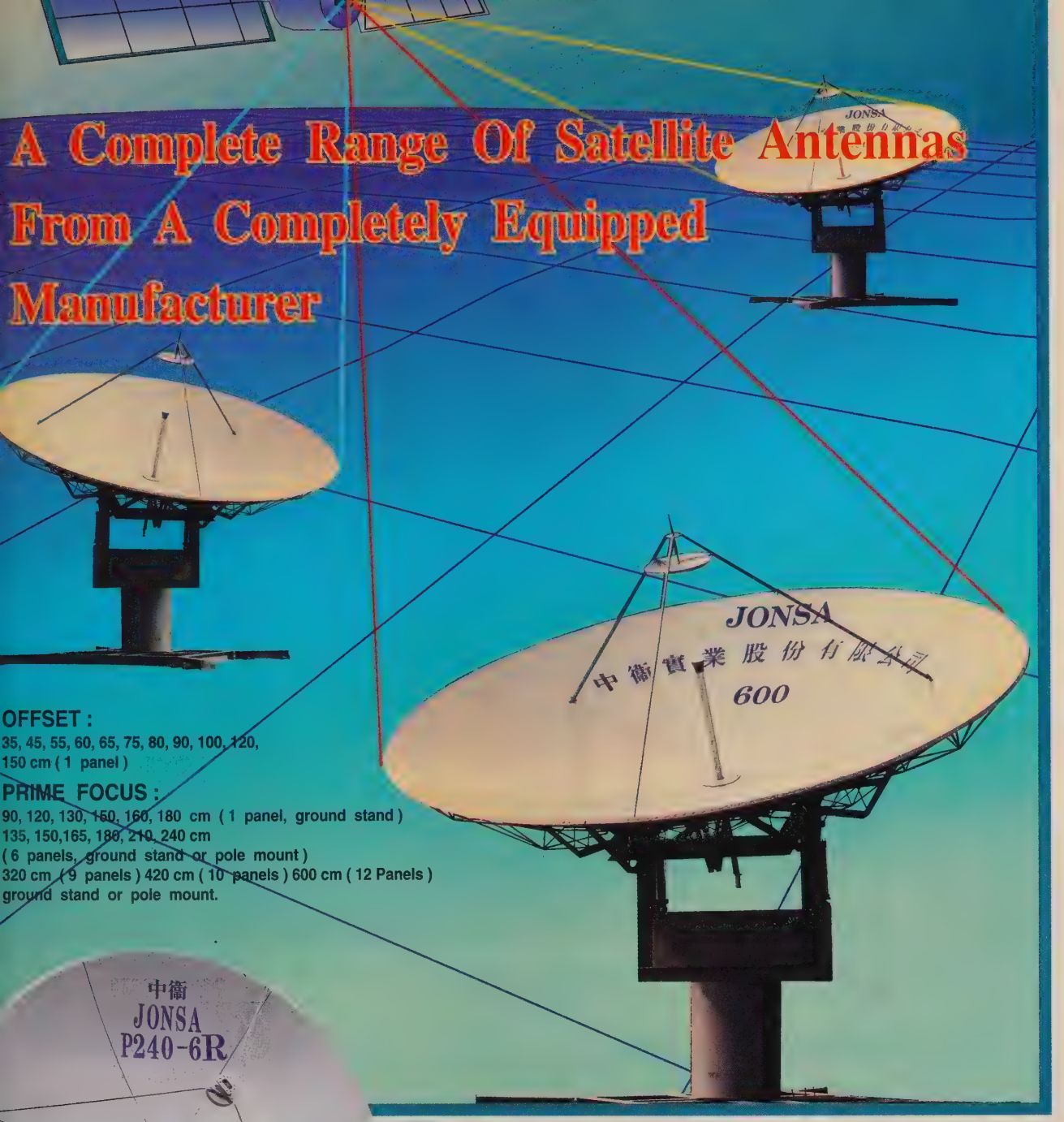

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35, 45, 55, 60, 65, 75, 80, 90, 100, 120, 150 cm (1 panel)

PRIME FOCUS :
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ground stand or pole mount.

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JONSA

Manufacturer & Exporter

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Aerospatiale	aerospatiale.fr
Alcatel	alcatel.com/space
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Asiasat	asiasat.com.hk
Astra	astra.lu
ATCi (Antenna Technology Communications Inc.)	atci.net
Avdata Systems Inc.	avdata.com
BAF Communications Corp.	bafcom.com
Ball Aerospace & Technologies Corp.	ball.com
Broadcast Satellite International Inc.	strategies.net/bsi
BT Broadcast Services	vbs.bt.co.uk
Calian	calian.ca
California Microwave EF Data	efdata.com
Canadian Satellite Communications Inc.	cancom.ca/
Centro Congressi Internazionale	fileita.it/cci/
Channel Master	channelmaster.avnet.com
CITS Inc.	cits-inc.com
Columbia Communications Corp.	tdrss.com
Columbia Institute for Tele-Information	ctr.columbia.edu/vi
Commercial Communication Systems Ltd.	comsys.co.uk
Commercial Satellite Systems Inc.	comsatsys.com
Comsat Laboratories	comsat.com/corp/lab/
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17	39	61	83	105	127	149	171	193	215	237	259
18	40	62	84	106	128	150	172	194	216	238	260
19	41	63	85	107	129	151	173	195	217	239	261
20	42	64	86	108	130	152	174	196	218	240	262
21	43	65	87	109	131	153	175	197	219	241	263
22	44	66	88	110	132	154	176	198	220	242	264

A. What best describes your firm's primary business? (check only one)

End User (Corp./Comm./Indus.)
- ❑ 01. Computers
- ❑ 02. Financial
- ❑ 03. Healthcare
- ❑ 04. Hotel/Lodging
- ❑ 05. Petroleum Retailer
- ❑ 06. Retailer
- ❑ 07. Transportation
- ❑ 08. University/School
- ❑ 09. End Users (Corporate/Commercial/Industrial)

Broadcasting and Cable
- ❑ 10. TV/Radio Broadcasting (AV/Film Post Production and Broadcast Facility)
- ❑ 11. Cable TV/Private Cable
- ❑ 18. Program Producer/Syndicator

Satellite Industry
- ❑ 12. Satellite Operator/Carrier
- ❑ 13. Transmission Services
- ❑ 14. Telecommunications Carrier (RBOC, Long Distance Carriers, Wireless Carriers, Gas & Electric Utilities)
- ❑ 15. Satellite Equip. Manufacturer
- ❑ 16. Satellite Equip. Distrib./Dealer

Business/Information Services
- ❑ 32. Financial Institutions
- ❑ 33. Consultant
- ❑ 34. Legal Services
- ❑ 35. Insurance
- ❑ 36. Brokers
- ❑ 37. Investors

Affiliated Organizations
- ❑ 17. Technical Service (Engr./Design)
- ❑ 20. Foreign or Domestic Govt. Agency (NASA/NASDA/ESA/PTT/Military)
- ❑ 21. Other (specify) _____

B. What best describes your job title? (check only one)
- ❑ 22. Pres/CEO/Owner
- ❑ 23. Vice Pres./General Mgr.
- ❑ 24. Mktg./Sales Mgmt.
- ❑ 25. News/Program Director
- ❑ 26. Engineering Mgmt./Tech.
- ❑ 27. Operations Mgmt.
- ❑ 28. Purchasing Mgmt.
- ❑ 29. Communications Mgmt.
- ❑ 30. Network Mgmt.
- ❑ 31. Other (specify) _____

C. Number of employees at your location?
- ❑ 38. 1-20
- ❑ 39. 21-50
- ❑ 40. 51-100
- ❑ 41. 101-500
- ❑ 42. 501-1000
- ❑ 43. 1001 or more

D. In the next 12 months, what satellite transmission services do you plan to buy? (Check as many as apply)
- ❑ 44. Audio Transmission
- ❑ 45. Data Transmission
- ❑ 46. Uplinking/Downlinking
- ❑ 47. Internet Transmission
- ❑ 48. Mobile Uplinking/Downlinking
- ❑ 49. Satellite Newsgathering
- ❑ 50. Teleconferencing and Videoconferencing
- ❑ 51. Video Transmission

E. What is your monthly transmission services expenditure?
- ❑ 52. Up to $10,000
- ❑ 53. $10,001 - $25,000
- ❑ 54. $25,001 - $50,000
- ❑ 55. $50,001 - $100,000
- ❑ 56. Over $100,000

F. In the next 12 months, what satellite products do you plan to buy? (Check as many as apply)
- ❑ 57. Adapters/Converters
- ❑ 58. Amplifiers
- ❑ 59. Antennas
- ❑ 60. Cables/Connectors
- ❑ 61. Earth Stations
- ❑ 62. Feeds/Feed Systems
- ❑ 63. Modulators/Demodulators
- ❑ 64. Filters
- ❑ 65. Power Supplies/Products
- ❑ 66. Multiplexors/Modems
- ❑ 67. Transceivers/Receivers
- ❑ 68. Shelters/Shielding/Mounts
- ❑ 69. Satellite Newsgathering Vehicles
- ❑ 70. Software
- ❑ 71. Tele/Videoconferencing Systems and Products
- ❑ 72. Test Equipment
- ❑ 73. VSAT Systems
- ❑ 74. Internet Products
- ❑ 75. Digital Video Systems
- ❑ 76. RF Switches

G. What is your monthly products expenditure?
- ❑ 77. Up to $10,000
- ❑ 78. $10,001 - $25,000
- ❑ 79. $25,001 - $50,000
- ❑ 80. $50,001 - $100,000
- ❑ 81. Over $100,000

H. In the next 12 months, what satellite technical services do you plan to buy? (Check as many as apply)
- ❑ 82. Needs Assessment, Site Survey and Prep.
- ❑ 83. Construction, Installation and Implementation
- ❑ 84. Design/Engineering
- ❑ 85. Frequency Coord. and License Preparation
- ❑ 86. Launch Services
- ❑ 87. Maint. and Operating Services
- ❑ 88. System/Hardware/Software Integration
- ❑ 89. Satellite Manufacturing Services

I. What is your monthly technical services expenditure?
- ❑ 90. Up to $10,000
- ❑ 91. $10,001 - $25,000
- ❑ 92. $25,001 - $50,000
- ❑ 93. $50,001 - $100,000
- ❑ 94. Over $100,000

J. Which one of the following best describes your involvement in the decision to purchase a product/service? (Check only one)
- ❑ 95. Recommend
- ❑ 96. Specify
- ❑ 97. Evaluate
- ❑ 98. Approve
- ❑ 99. Not involved

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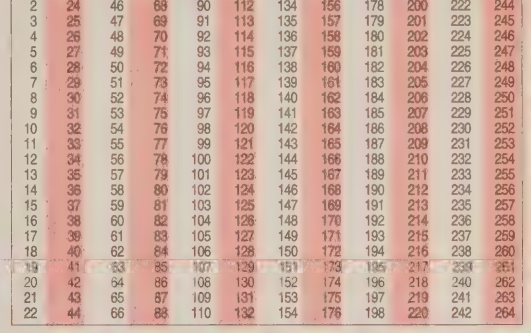

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66. Multiplexors/Modems
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97. Evaluate
98. Approve
99. Not involved

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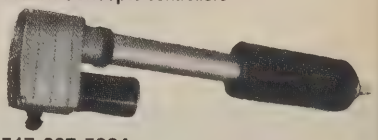

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Dollars and Sense

It's All in the Numbers

By Mark Crossman

Knowing how many potential subscribers the mobile satellite market is going to have is vital. If you know how many subscribers there are, then you know what pricing is going to be, then you know exactly what the market is going to look like. Everyone is trying to guess because if you know the answer, then you know which big LEO stocks are a buy and which ones are not.

More than 3 billion people do not have access to a phone today. As a result, one might assume that the addressable market for mobile satellite services is in the billions. It is not.

Actually, the subscriber base is between 7 million to 13 million subscribers by the year 2005.

Currently there are 70,000 subscribers to mobile satellite services. These subscribers are using briefcase size phones. The new systems will blow this technology away.

The phones have emerged from a briefcase size phone with a 1/4 second receive/transmit delay and less than one hour of talk-time to a handheld phone with virtually no delay and a significant increase in talk time. With such improvements, the big LEO market will obtain at least a 70,000 subscriber base.

Therefore, starting with this base and applying the U.S. cellular growth rate to that number, the big LEOs will acquire between 7 million and 13 million subscribers by the year 2005.

Now, which systems will survive? If the market tends to attract the lower end of this range, then only one or two systems will go up. If the market tends to be on the higher end of the range, then Iridium, Globalstar, ICO, Ellipso and ECCO will survive.

In the beginning, Iridium and Globalstar will have an oligarchy. Iridium has already launched half of its system and will be the first company to initiate services. Globalstar is getting ready to launch this month (as of press time).

ICO is in the process of building satellites and will most likely start launching in the first quarter of 1999. ICO has not received as much attention as Iridium or Globalstar, but will most likely surprise investors with its progress going into 1998.

Ellipso and ECCO are still in the process of locking up financing to begin construction of their satellites.

Indeed, it is too early to place bets on any one big LEO system. The key to understanding the mobile satellite market is to put the magnitude of demand into a perspective that focuses on the year 2005 or 2010, not 1998.

Cellular Growth Rate Application

Date	U.S. Cellular Subscribers	U.S. Cellular Subscriber Growth Rate	Low Assumption MSS Subs	Worldwide Satellite Subscriber Growth Rate	High Assumption MSS Subs
Dec. 84	91,600				
Dec. 85	340,213	271%			
Dec. 86	681,825	100%			
Dec. 87	1,230,855	81%			
Dec. 88	2,069,441	68 %			
Dec. 89	3,508,944	70%			
Dec. 90	5,283,055	51%			
Dec. 91	7,557,148	43%			
Dec. 92	11,032,753	46%			
Dec. 93	16,009,461	45%			
Dec. 94	24,134,421	51%			
Dec. 95	33,737,000	40%			
Dec. 96	44,307,000	31%			
Dec. 97E*	54,757,665	24%			
Dec. 98E	63,222,704	15%	20,000		150,000
Dec. 99E	70,079,385	11%	74,282	271%	557,117
Dec. 00E	75,633,297	8%	148,870	100%	1,116,526
Dec. 01E	80,131,965	6%	268,746	81%	2,015,592
Dec. 02E	82,049,819	2%	451,843	68%	3,388,823
Dec. 03E	84,013,574	2%	766,145	70%	5,746,087
Dec. 04E	86,024,328	2%	1,153,505	51%	8,651,291
Dec. 05E	88,083,208	2%	1,650,032	43%	12,375,242

*E = Estimate
Source: CTIA, Oppenheimer & Co. Inc. estimates

Marc Crossman is a vice president and satellite communications analyst for Oppenheimer & Co. Inc. in New York City. These views are those of the author and do not necessarily reflect the views of the Via Satellite editors or Oppenheimer & Co. Inc.

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Comtech Transportables

The best travel companions for your communication needs!

3.8 Meter

There's a Comtech transportable antenna size with capabilities to meet any requirement!

The 2.4 Meter transportable antenna is ideally suited for the C or KU-Band data/video market. This unique one-piece design allows for very low profile transport and shipment.

5.0 Meter

Our 3.8 Meter and 5.0 Meter antennas fold down to low, over-the-road profiles for safe and easy transport. Both of these antenna systems can be used for audio and video downlinks as well as private cable site surveys, sales demonstrations, and teleconferences.

Military-type 3.8 Meter

Military-type 5.0 Met

The OFFSAT is the most successful, C-Band transportable of its kind on the market today! Capable of both audio and video uplink and downlink, this antenna system is used extensively for teleconferencing and special events coverage, world-wide.

Ask about our custom trailer design and manufacturing capabilities.

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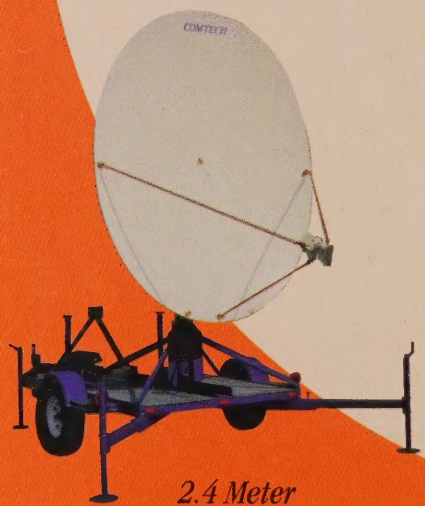

2.4 Meter

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